ARIZONA

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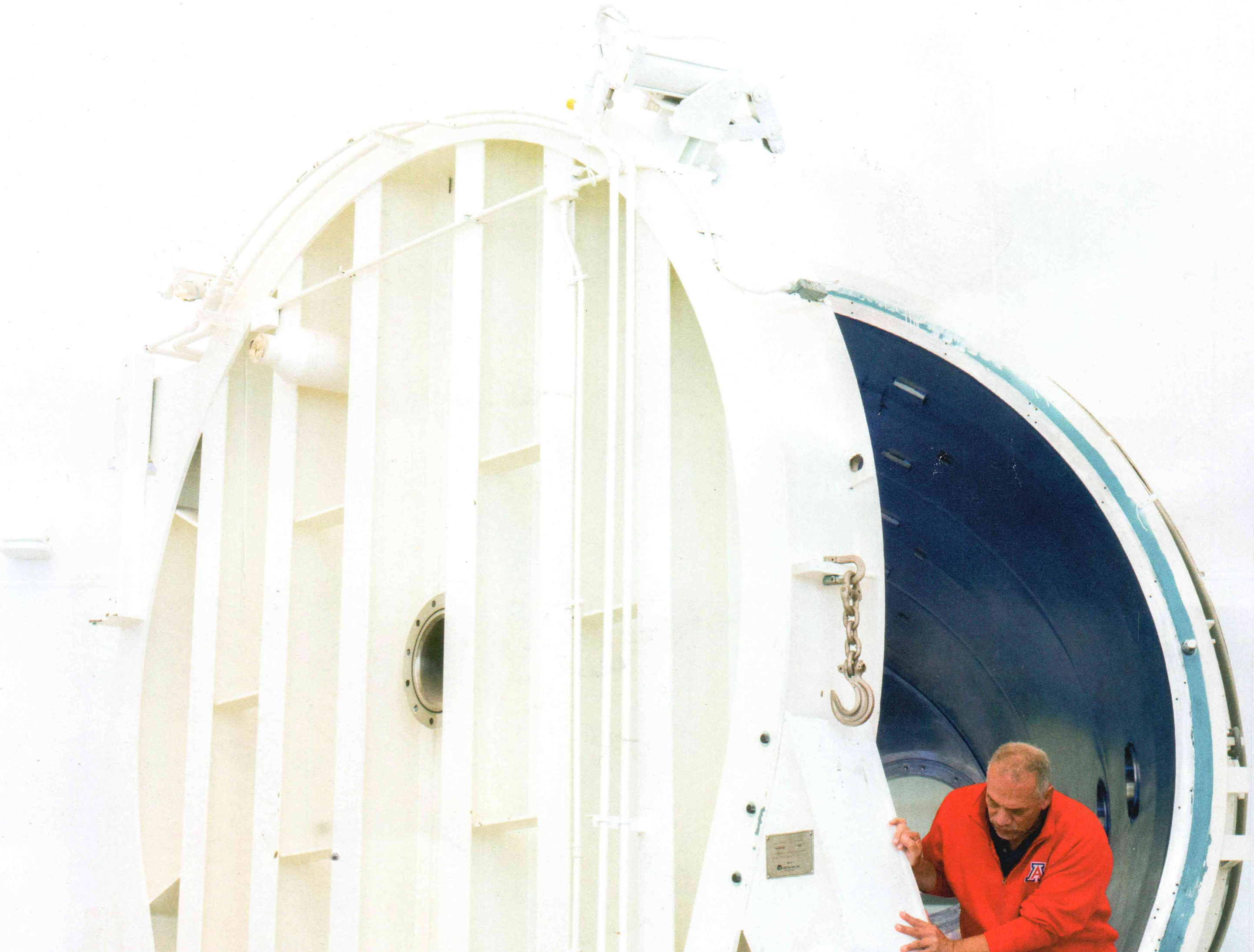

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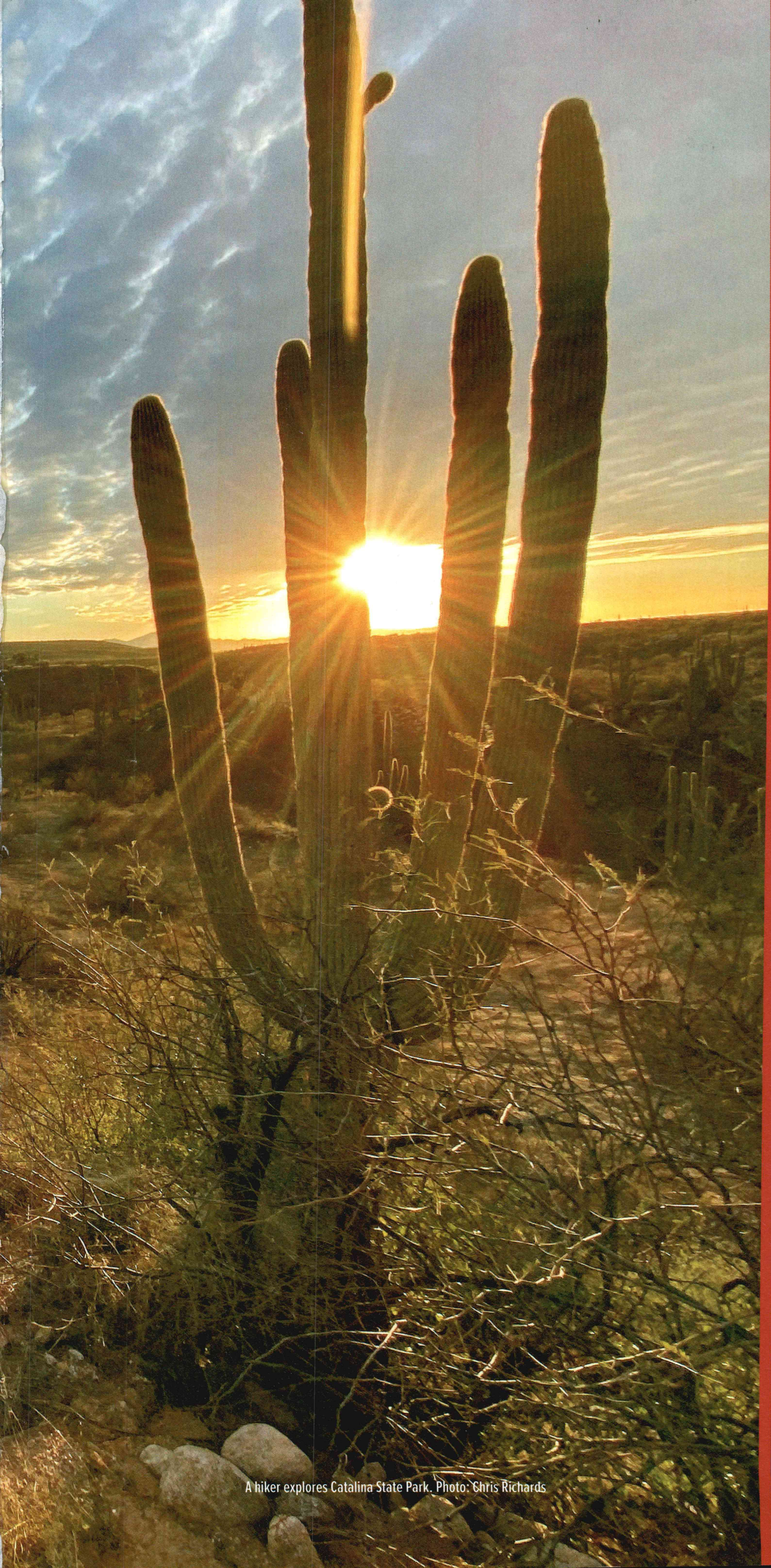

A hiker explores Catalina State Park. Photo: Chris Richards

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LETTERS TO THE EDITOR

Share your magazine feedback by submitting a letter to the editor at alumninews@al.arizona.edu.

HOORAY!

The 2022-23 members of the Bobcats Senior Honorary celebrate their graduation.

ARIZONA

ALUMNI MAGAZINE FALL 2023

ON THE COVER

Ruben Dominguez, a senior mechanical engineer at Steward Observatory, eases open the thermal vacuum chamber inside the university's new Applied Research Building.

DEPARTMENTS

4 Leadership
6 Grand Challenges
10 Our Story
12 Rare Finds
14 Health Sciences
16 Donor Spotlight
18 Wildcat Journey
20 In the Arts
40 Q&A
44 Spirit of Wonder
52 Club Sports
56 Arizona Athletics
62 Class Notes
65 In Memoriam
66 Tradition
68 Reflection

FEATURES

24

JOURNALISTS OF RECORD

Soon, Arizona Public Media will break ground on a new and improved campus home: the Paul and Alice Baker Center for Public Media. The upgrade comes during a season of change in the news industry.

28

SKYWARD

On Sept. 24, planetary scientists and close friends Dani DellaGiustina and Dante Lauretta become part of NASA history as principal investigators for the OSIRIS-REx mission, which is set to return an asteroid sample to Earth.

36

A ROSE FROM CONCRETE

Fifty years ago, a DJ in the Bronx began toying with his turntables, and hip-hop music began. UArizona's Africana studies department has listened closely.

Photo: Chris Richards

MESSAGE FROM PRESIDENT ROBBINS

Kiisonvi
The focal point of a community where
thoughts and prayers become one to benefit all life - Hopi
OLD MAIN

Photo: Chris Richards

Dear Wildcats,

It has been an incredible summer. The National Aeronautics and Space Administration, or NASA, and the University of Arizona-led OSIRIS-REx team have been preparing for the long-awaited arrival of the Bennu asteroid sample capsule on Earth. It is scheduled to drop into the Utah desert on Sept. 29 — and then begins the exciting work of learning all we can from the sample. The insights it promises to reveal about our solar system and the entire universe are amazing to think about. And though the sample from Bennu will be on Earth, the spacecraft's work is not done. Read about the next phase of the project and a change in mission leadership on Page 29, and if you want to learn more about Bennu, you can find a book, "Bennu 3-D: Anatomy of an Asteroid," detailing its topography. I had the pleasure of attending the London launch for this amazing book co-written by our very own Dante Lauretta, members of his OSIRIS-REx team and Sir Brian May, an astrophysicist and the lead guitarist of Queen.

The university also announced the College of Health Sciences this summer — part of our strategy with the Arizona Board of Regents to meet the critical health care shortage in our state. Based in Tucson, the new college is the sixth in the UArizona Health Sciences portfolio and will be the academic home of five graduate degree programs: midwifery, physician assistant, doctor of physical therapy, genetic counseling and clinical translational sciences.

Moving into the fall semester means the start of a new season of college sports, and in August we announced that the university will join the Big 12 Conference in all sports beginning in the 2024-25 academic year. Our move to the Big 12 will continue to raise the university's profile by increasing visibility, growing our reach across the country and around the globe, expanding our pool of prospective students, and providing more resources to support our student-athletes. Our athletics department is working around the clock with alumni, donors and community partners to provide student-athletes with ways to succeed in this new landscape. You can read more about the university's latest NIL efforts, among them the Desert Takeover Football Collective, on Page 56.

Finally, I hope you'll join us on campus for a very special Homecoming week, during which we will celebrate wonder. In addition to our traditional programming, watch for details about the TEDxUArizona series on Nov. 1 and a special interactive exhibit on the Mall during the Wildcat for Life Tailgate. I cannot wait to share that time with you.

Bear Down and Go, 'Cats!

Robert C. Robbins

Robert C. Robbins, M.D.
President
The University of Arizona

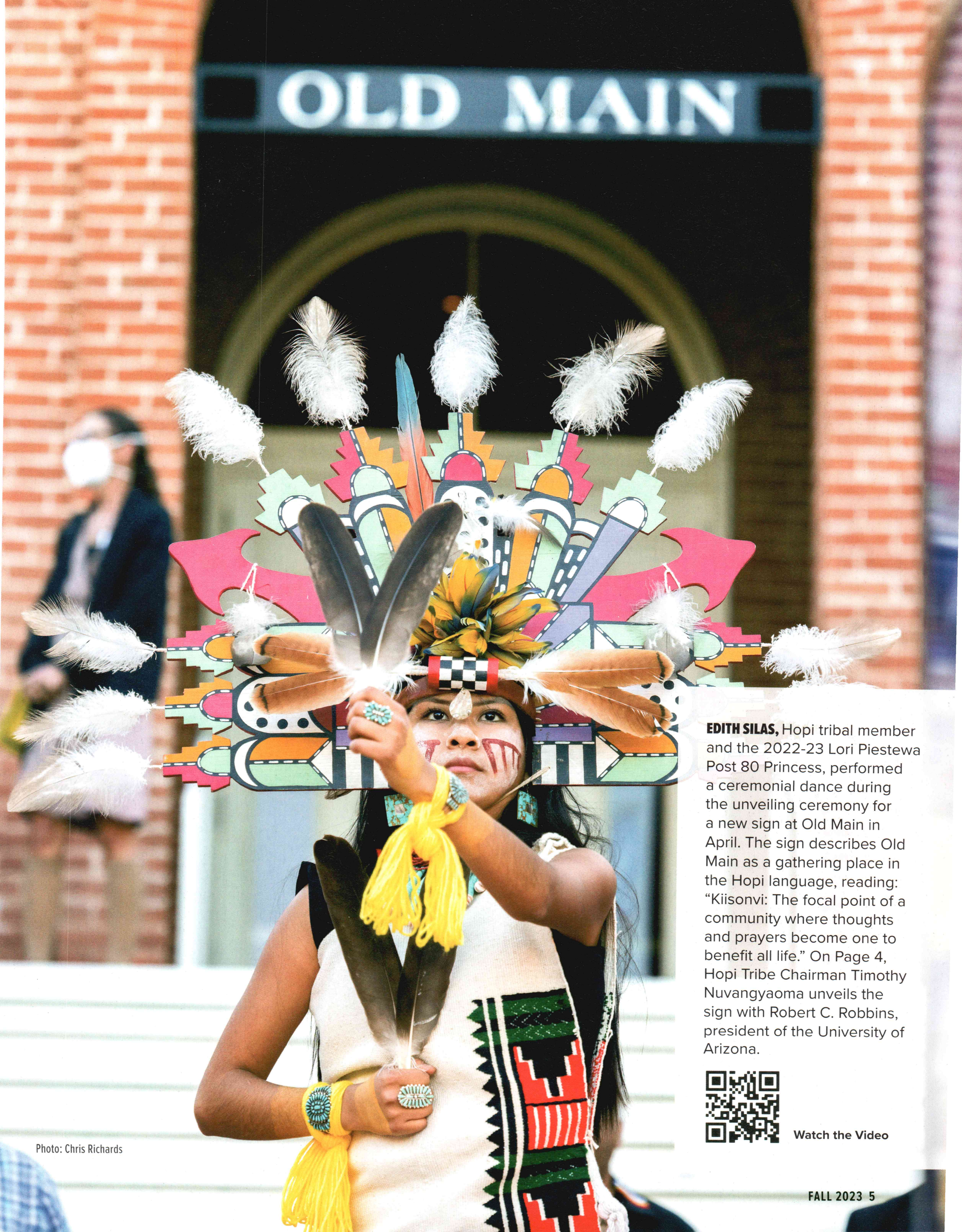
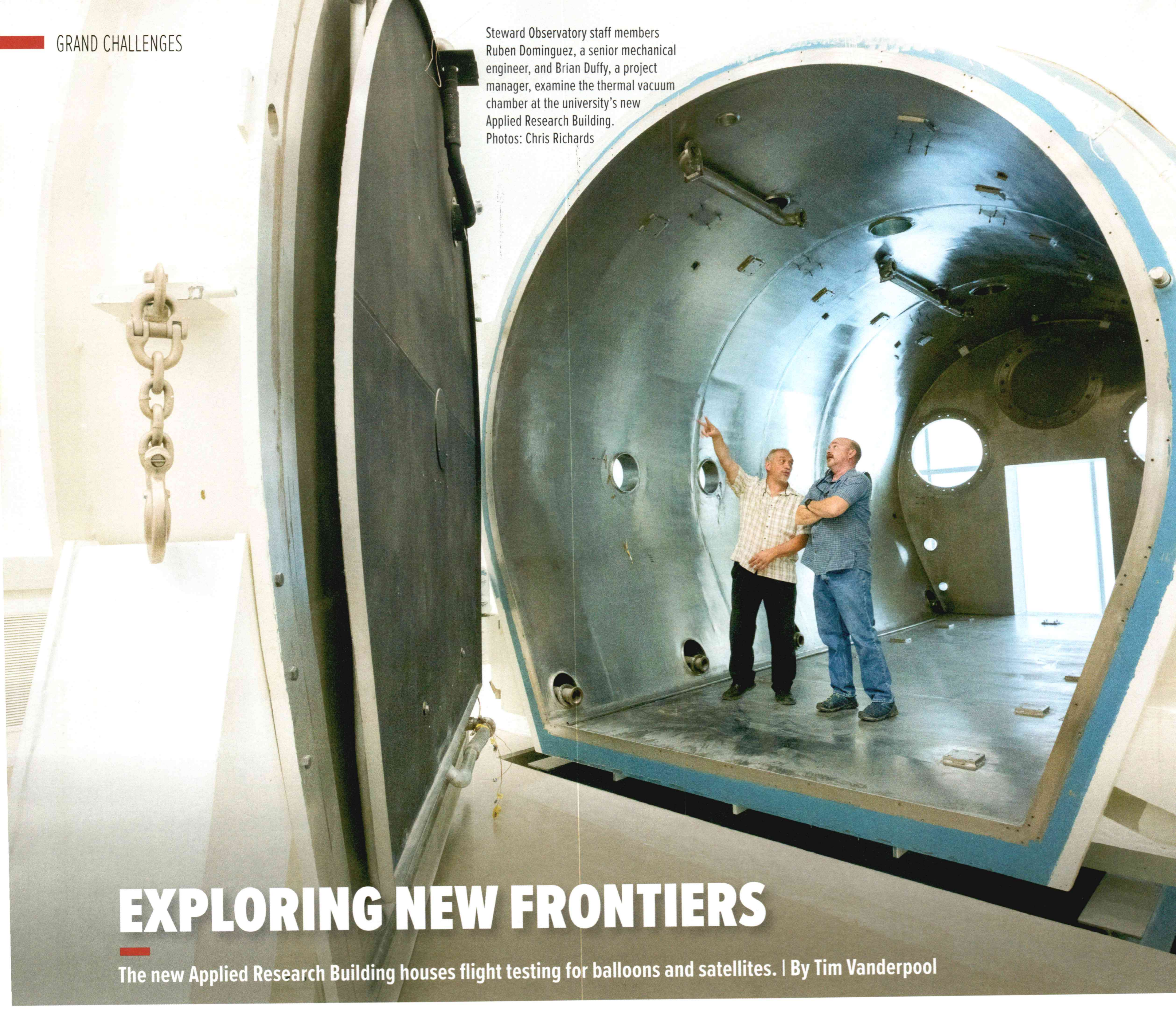


Photo: Chris Richards

EDITH SILAS, Hopi tribal member and the 2022-23 Lori Piestewa Post 80 Princess, performed a ceremonial dance during the unveiling ceremony for a new sign at Old Main in April. The sign describes Old Main as a gathering place in the Hopi language, reading: "Kiisonvi: The focal point of a community where thoughts and prayers become one to benefit all life." On Page 4, Hopi Tribe Chairman Timothy Nuvangyaoma unveils the sign with Robert C. Robbins, president of the University of Arizona.

Watch the Video



Steward Observatory staff members Ruben Dominguez, a senior mechanical engineer, and Brian Duffy, a project manager, examine the thermal vacuum chamber at the university's new Applied Research Building. Photos: Chris Richards

EXPLORING NEW FRONTIERS

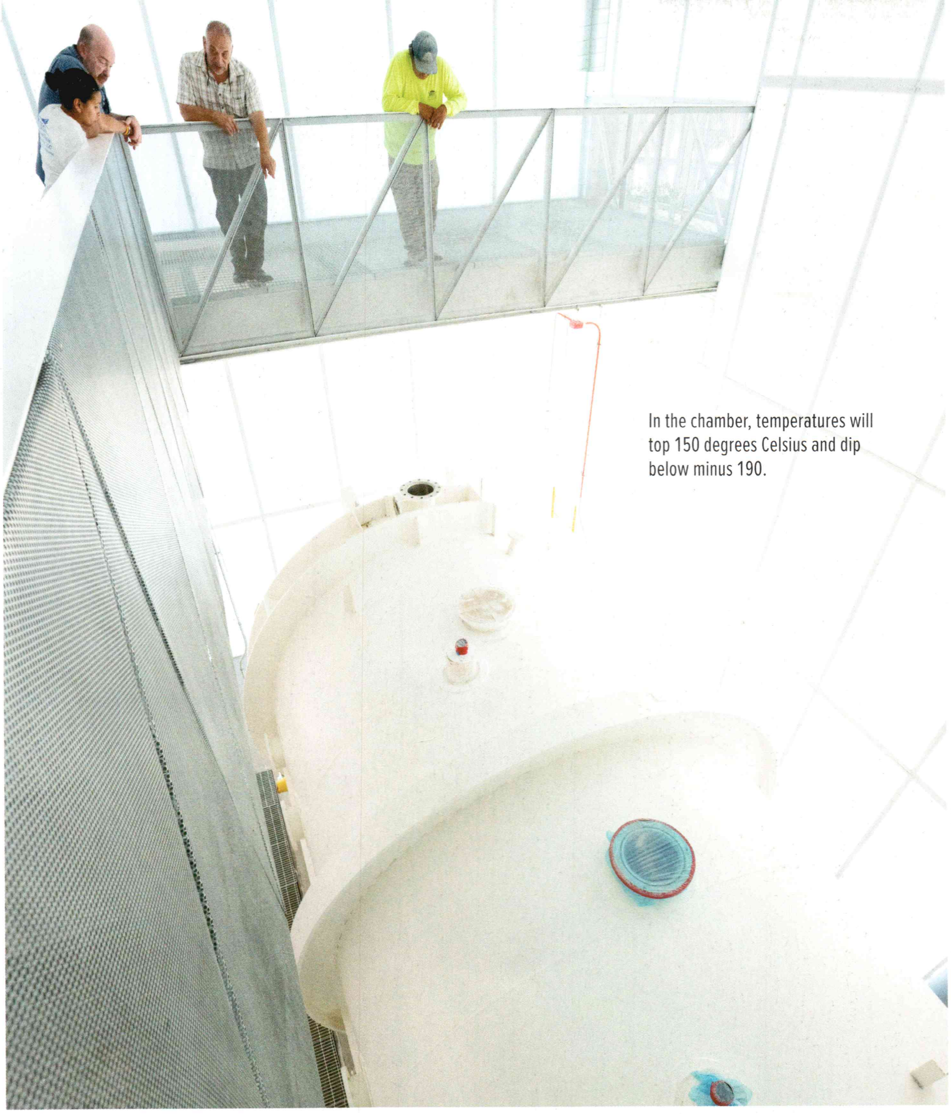
The new Applied Research Building houses flight testing for balloons and satellites. | By Tim Vanderpool

The University of Arizona celebrated the grand opening of its dazzling three-story, $85 million Applied Research Building in early April. Located on Helen Street, this edifice of shimmering glass and metal with International Space Station-inspired fins will serve as a cutting-edge home for the Arizona Space Institute. It's the nation's first integrated facility to house everything from space debris analysis to an anechoic chamber for antennae command, control and data-relay testing all under one roof.

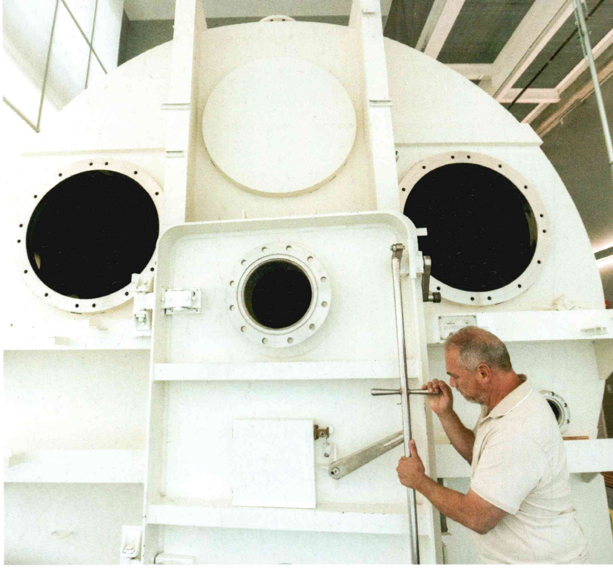
The project marks a profound commitment to the future, as UArizona President Robert C. Robbins noted before the celebratory crowd. "You can't translate research into applied science," he said, "without an investment in fundamental discovery."

Among other features, this particular investment includes a fabrication lab for cereal-box-sized satellites called CubeSats, a curation facility for differentiating between space junk and natural objects like meteorites, and a 40-foot-high bay for assembling stratospheric balloons used for everything from weather mapping to NASA missions.

The new building is also home to a 30-foot-long, 81,000-pound leviathan called a thermal vacuum chamber. This formidable device is big enough to hold a pickup truck, but its primary mission is testing space-based satellites and balloon payloads in conditions similar to space. Within the chamber, satellites will be subjected to enormous pressure and temperatures topping 150 degrees Celsius or dipping below minus 190. This testing not only provides precious data for research but also safeguards enormously expensive spacecraft from unforeseen flaws.



In the chamber, temperatures will top 150 degrees Celsius and dip below minus 190.



Think of it in terms of car-buying. Would you purchase a new car that's never traveled beyond the factory floor — never been checked for leaky seals or wheezy gaskets or highway handling? Probably not.

Now imagine launching a $50 million satellite without knowing whether it can withstand the extreme rigors of space. Far better to give it a "test drive" in the thermal vacuum chamber first. Even at a cost of about $12,000 a day, that's a bargain, according to Ruben Dominguez. He's a senior mechanical engineer with Steward Observatory, the astronomy department's research arm.

"The cost to run a thermal vacuum test is well worth it," he says. "If your satellite doesn't work while it's up in space, then you just lost a million dollars or more — compared to testing, which is about a tenth of that."

The chamber likewise simulates the extraordinary pressure drops that balloons experience when going from sea level to altitudes above 100,000 feet. In the chamber, pressure is manipulated by vacuum pumps, Dominguez says. "It will also simulate temperature change," he continues. "We launch balloons mostly from Antarctica, where the temperature will be right above zero Celsius. Then the balloon payload goes up through the atmosphere; at 50,000 feet, the temperature drops to about minus 50 Celsius, and at 120,000 feet, the temperature is about minus 10 Celsius. The chamber does all of that in a process that takes about 2 ½ to three hours."

In short: very important testing achieved by highly specialized machines. Of course, you could only dream of your car retaining the value of these coveted thermal vacuum chambers. This one, which is 34 years old, was purchased from aerospace giant Northrop Grumman for around $1 million. It's being retrofitted with the latest equipment — including modern vacuum pumps that are oil free, lessening the potential for contamination of satellites — and the cryoshrouds that produce those stunningly low temperatures.

Despite the high demand for such testing devices and the proceeds they can generate, this chamber brings far more value to the university than just revenue. There are also the intellectual profits from being a part of so much high-level testing. "Since we are getting a lot of projects for space, our researchers and students here will also be learning a lot," Dominguez says.

"Reports are usually done after a satellite is tested inside the chamber," he continues. "Some of them are classified, so you'll never know about it. But the majority of them are published in journals, which we can all continue to learn from."

Now that's a fundamental investment indeed.

GREEN RUBBER

Kim Ogden
Photo: Julius Schlosburg

University of Arizona research is transforming the desert shrub guayule into rubber.

By Chris Quirk

University of Arizona researchers are teaming up with Bridgestone Americas Inc. to develop a new variety of natural rubber from a source that is more sustainable and can be grown in the forbidding conditions of the arid Southwest.

Kim Ogden, head of the department of chemical and environmental engineering, is the principal investigator on a five-year, $70 million project focused on growing and processing guayule (pronounced why-OO-lee), a hardy, perennial shrub that could be an alternative source of natural rubber.

The U.S. Department of Agriculture provided a $35 million grant for the project, which was matched by Bridgestone, the tire and rubber company. The goal is to help growers transition to guayule crops from their traditional rotations of hay, cotton and wheat.

Additional partners on the project include the Colorado River Indian Tribes, Colorado State University, regional growers and OpenET, a public-private partnership that facilitates responsible water management.

Bridgestone has been working with guayule at the company's 280-acre farm in Eloy, about halfway between Phoenix and Tucson, since 2012. The company plans to expand the farm to 20,000 acres in the next several years by working with Native American farmers, to grow guayule on tribal lands, and to collaborate with other area farmers.

"Eventually, we hope to have plantings of around 100,000 acres spread out across 15 or 20 facilities across the Southwest," says David Dierig, section manager for agro operations at Bridgestone.

Why guayule?

Rubber is currently sourced from a single species — *Hevea brasiliensis*, or the Pará rubber tree — grown almost exclusively in Southeast Asia.

Having a single source for rubber globally means the supply of this critical material can be precarious and subject to market volatility. The Pará rubber tree crop is susceptible to disease, particularly leaf fall disease. In addition, the price of rubber is affected by increasing labor costs, and there is the potential for disruption caused by geopolitical disorder, Ogden says.

"There is a big risk, as well as supply chain problems, when you have all the natural rubber coming from one region of the world," Ogden says. "The goal for Bridgestone and for the other tire companies is to find reliable, domestic sources of rubber."

Scientists have had their eyes on guayule as a rubber producer for over a century, Dierig says. The shrub, which matures in just two years, is native to the Chihuahuan Desert in northern Mexico and southern New Mexico.

"People had looked at this plant as far back as World War I, and during World War II there was a ton of research because our rubber supply got cut off," Dierig says.

The Emergency Rubber Act, passed by Congress in 1942, directed scientists to find alternative sources for rubber, and guayule was in the mix.

"They probably had around 30,000 acres of it planted here in Arizona, and they found a lot of facets to it that were advantageous," Dierig says.

Interest in guayule eventually faded, and the Pará rubber tree remained the sole source of industrial rubber. But the need for a new rubber source has once again become pressing. "Reducing the amount of rubber we are importing from Southeast Asia is also going to help with biodiversity and climate change," Dierig says.

While synthetic rubber, which is derived from petroleum, is suitable for limited uses, it can't fully replace natural rubber because it does not have the same resilience. It can't be used in the most demanding products, such as tires for airplanes or large agricultural vehicles.

Climate- and market-smart solution

The grant will fund the development and refinement of climate-smart guayule growing practices.

"We want to use less water, install irrigation systems to avoid flood irrigation, use less fertilizer and educate the growers," Ogden says. "If you're looking at a big system life-cycle assessment, this is going to cut down on greenhouse gases."

Unlike annual crops, which require tilling the land every year, guayule is perennial. That makes no-till and low-till farming viable practices, and growing perennial crops is one method of carbon sequestration: storing carbon dioxide in the soil rather than the air. In addition, guayule has natural properties that deter insects, so no insecticides are needed once the plants reach early maturity.

As promising as guayule is as a source of natural rubber, growing it to produce rubber alone is not economically viable, so Ogden is working to find additional products that could be derived from guayule and marketed to supplement the revenues from manufacturing rubber products. In addition to a rubber content of about 5%, guayule has a resin content of 7% to 9% that could be used to make natural adhesives and insect repellents. The rest of the plant is woody biomass that could be converted into biofuel or used to make particle board.

Though the guayule industry is still in its infancy, rubber made from the desert shrub is already popping up in some interesting places. Bridgestone recently released a new Firestone racing tire, Firehawk, that contains guayule rubber. The tires, sporting distinctive lime green accents on the sidewalls, debuted as part of the IndyCar circuit races during the Pit Stop Challenge last year, as well as the Big Machine Music City Grand Prix in Nashville. After last year's successful run, the tires are being used in IndyCar's five street-circuit races this season.

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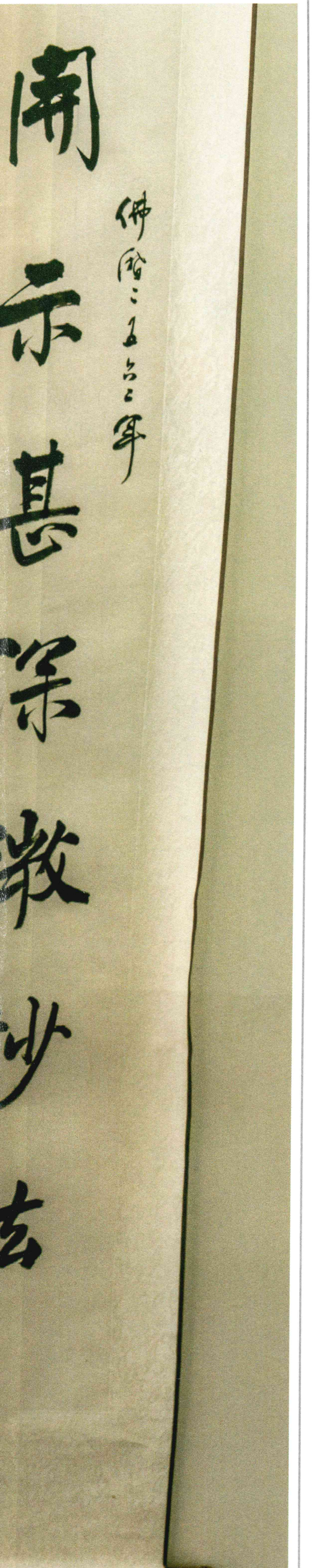
Religion of the Mind

Guggenheim fellow Jiang Wu studies Buddhist scripture through people.

By Matthew Morris

Jiang Wu
Photo: Chris Richards



Jiang Wu writes microhistory. The subject he most loves — the Buddhist canon, the collection of texts comprising scripture — might be abstract, he says. But through the study of individuals, he brings the world of ideas down to size. Over the centuries, he says, there have continually been human actors — Chinese, Japanese and British diplomats and historians, scholars and monks — "surrounding the canon, helping it move."

Wu, a professor in the University of Arizona's department of East Asian studies within the College of Humanities, wrote his book "Leaving for the Rising Sun" about the Chinese monk Yinyuan Longqi (1592-1673), who founded the Ōbaku school of Zen Buddhism in Japan after traveling to the island nation in 1654 to raise a temple.

Now, Wu will sustain his studies of the Ōbaku canon — writings, he says, that carry "modern significance" — with the support of a Guggenheim Fellowship, a $60,000 research award given to scholars and artists so that they can proceed with their work in "the freest possible conditions."

Wu, also the founding director of the Center for Buddhist Studies on campus, calls the award "something very unique, because it's not just supporting your projects, but it's a recognition of your past achievement as well."

He grew up in China, where he studied philosophy — but also thought plenty about spirituality — at Nankai University. Policy in China, he says, "is not favorable to religion." Monks don't appear on television except when supported by the government; philosophy departments become the places to consider faith, which Wu says is not about worship or superstition but rather "people's inner world."

He accesses that interiority through microhistory, the attempt to reconstruct a person's life and thoughts. Such an effort means poring over archival documents — for instance, the detailed diaries of Japanese delegates to Britain and the United States in 1871 and 1872, after Japan's military government, or shogunate, fell during the Meiji Restoration.

The delegates, upon returning to Japan in 1873, sent a copy of the Ōbaku canon to the British Empire's Indian Office Library, where scholar Samuel Beal was tasked with completing the first English catalog of East Asian Buddhist scriptures. His cataloging methods, Wu says, influenced the Taishō Buddhist canon compiled in 1930s Japan. Today, the Taishō canon reigns.

"We're talking about a process starting from the Ōbaku canon until the creation of the standard canon," Wu says of his Guggenheim-supported project, "Scripture and Modernity: The Ōbaku Buddhist Canon in East Asia and the West." Among other places, the work will take him to the British National Archives, and, with students, he will visit Yinyuan's Manpukuji Temple in Uji, Kyoto prefecture, to view the carved wooden blocks used to record Buddhist scripture in brushed ink.

"I want to trace this transformation, and this transformation happened in the modern time," he says. "So, then you have an interesting clash of culture, of course, but also assimilation and diplomatic tensions."

Wu cares about the inner life in part because he believes that the world is driven by ideas, which underlie not only spirituality but also science and technology. Change, as he sees it, comes from the mind.

Buddhism, he says, is "a religion about the mind." It tries to "tackle the issue of the mind," asking its practitioners to "go inside," including through meditation. The faith's contemplative aspect, he says, makes it popular today, when anxiety, depression and stress afflict many.

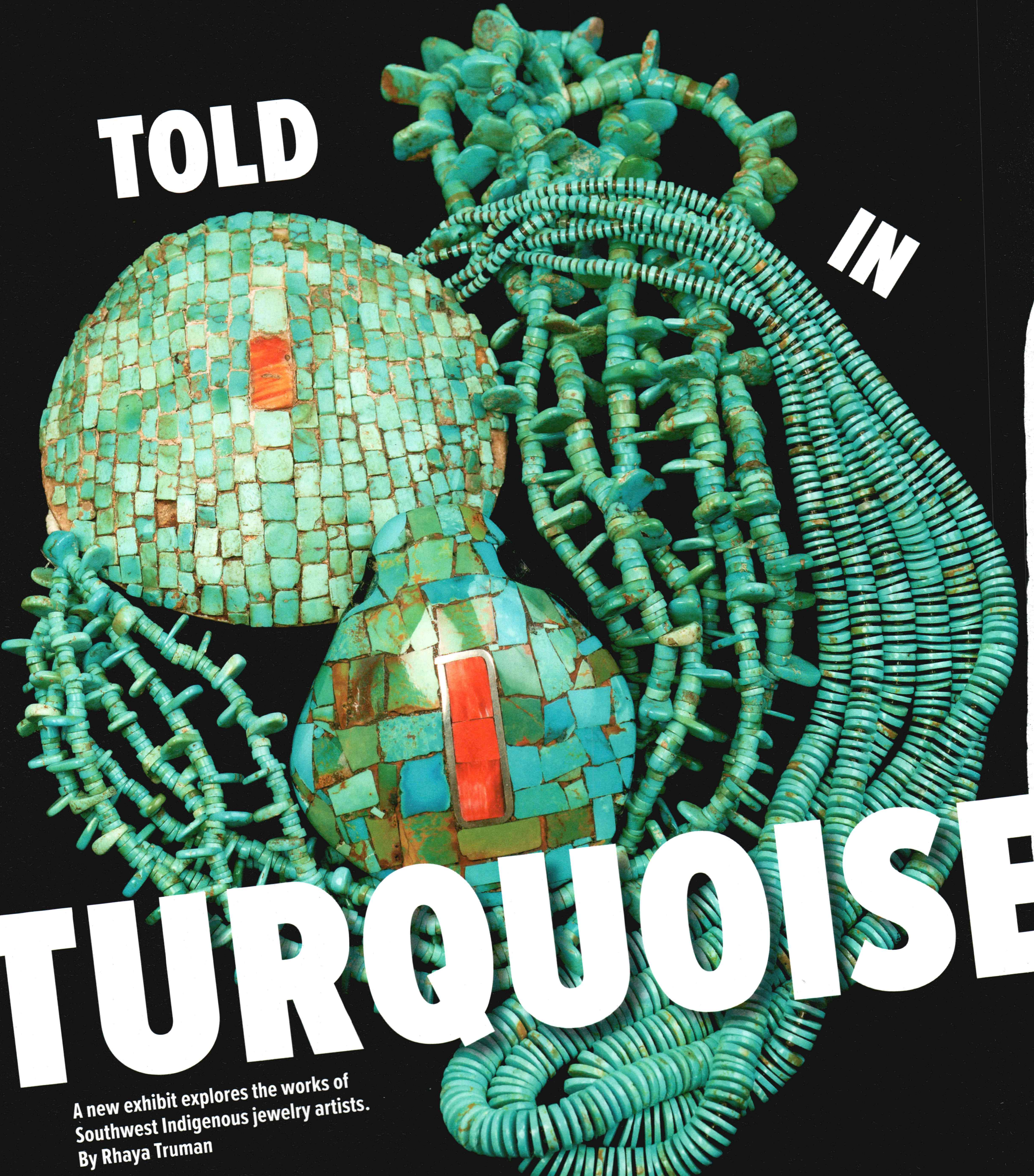
Because of the connections between Buddhist practices and health — both mental health and physical health, as the faith promotes vegetarianism — Wu's Center for Buddhist Studies has collaborated with UArizona's Andrew Weil Center for Integrative Medicine. Wu says that the Buddhist studies center, established in 2017, is meant to be "a connector," and not only with Weil.

In this spirit, he thanks the individuals and groups at and beyond the university who have pushed him and the center forward, including his home department and college, Weil himself, and the John Simon Guggenheim Memorial Foundation.

Neither Wu nor the center is done, he says. With his funding, he'll write a book, taking the spring semester off from teaching.

As for the center, he says, "Our goal is to help to enhance our consciousness in the way we do the common good."

TOLD IN TURQUOISE



A new exhibit explores the works of Southwest Indigenous jewelry artists.

By Rhaya Truman

Display cases of alluring silver, turquoise and shell necklaces make up part of the ancient, historic and contemporary ewelry crafted by regional ndigenous artisans in the Arizona State Museum's newest exhibit, "Ancient – Modern: Continuity and nnovation in Southwest Native Jewelry."

Open until February 2024, the exhibit also features intricate mosaic jewelry, along with silver bracelets, belt buckles, pendants and rings. It explores the deep cultural significance behind the use of specific materials, like turquoise and silver, and other Indigenous values and traditions the jewelry represents.

"We didn't want to speak for Native artists; so, we incorporated ewelry makers' own voices to express the values that come from their individual and cultural roots. This was especially important when t comes to turquoise and shell that have been used for millennia," says Diane Dittemore, the museum's associate curator of ethnology. "Through their work, they honor elements of nature. There are gender associations related to the colors of the stones — and to some shells, which originate from trade sources going back thousands of years."

One highlight of the exhibit is a necklace of turquoise discovered in 1965 by a Tucson girl, Tani Bahti, while she picnicked with her family in the Santa Rita Mountains. Dating to circa 950-1150, the beads are seen as stellar examples of Hohokam artisanship.

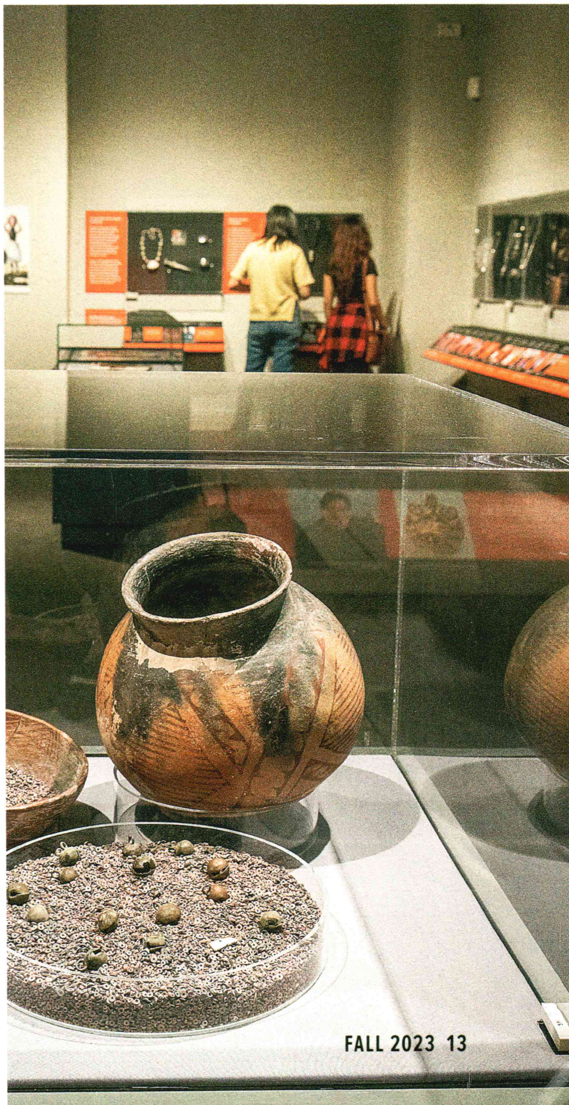
Dittemore notes that this exhibit tells stories that have "a deep resonance with members of the Tucson community who know about the history behind some of these pieces we display. For example, we showcase a pot and its contents discovered by rancher Rey Romo in November 1949 while hunting on the west side of the Santa Catalina Mountains north of Tucson." It is a red-on-brown earthenware jar, with a cover that contained approximately 90,000 stone beads and over two dozen spheroidal copper bells, each equipped with a ring eyelet for suspension. Such bells were traded into the area from western Mexico.

The exhibit also features prize-winning jewelry purchased from artists who participated in the museum's former Southwest Indian Art Fair and works made by students who participated in the Southwestern Indian Art Project, a Rockefeller Foundation-funded program at the University of Arizona between 1960 and 1962 that introduced promising young Native American students to contemporary art concepts, with Native faculty including famous Hopi artist Charles Loloma.

"We are thrilled to be able to showcase the work of these artists from 60 years ago," Dittemore says, "along with works from some of the best contemporary jewelry artists."

Ancient and modern jewelry pictured: Hohokam beads, c. 950-1150, and Kewa (Santo Domingo) beads by Joseph Pacheco, 1998. Mogollon turquoise mosaic, c. 1200-1400, and Kewa (Santo Domingo) turquoise mosaic by Mary Lovato, 2020. Photo: Max Minj

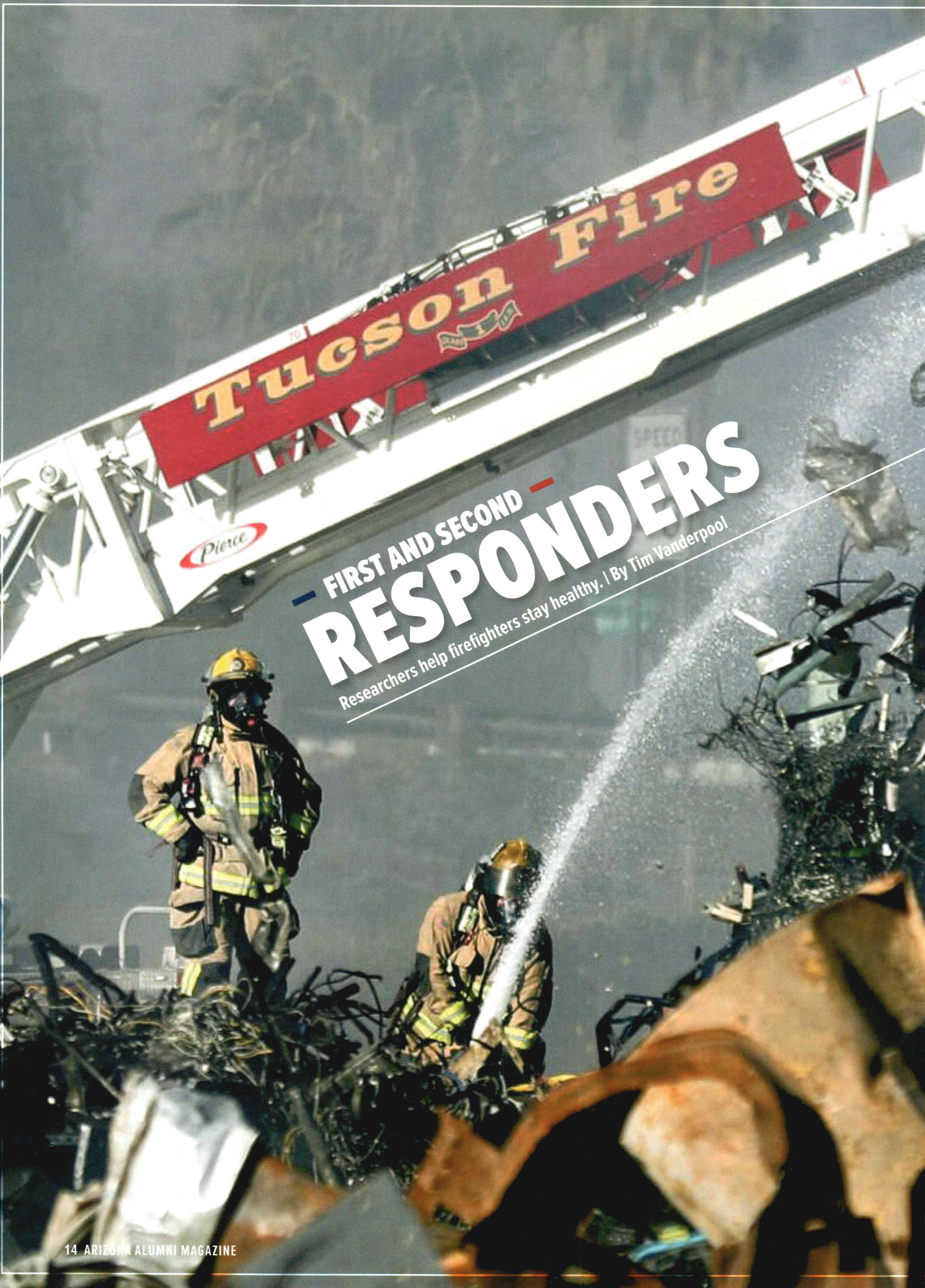
Visitors check out the exhibit on opening day. Photos: Chris Richards



FIRST AND SECOND

RESPONDERS

Researchers help firefighters stay healthy. | By Tim Vanderpool



Long after a blaze has finally gone cold, firefighters still face dangers to their physical and mental health, including heightened risks of cancer and post-traumatic stress. While these first responders can pay a high price for protecting us all, a vigorous partnership between the University of Arizona and Tucson Fire Department is helping ratchet down those costs.

UArizona is committed to improving the lives of firefighters — by reducing carcinogen exposure and boosting emotional well-being — through its new Center for Firefighter Health Collaborative Research in the Mel and Enid Zuckerman College of Public Health. "We're doing things that can provide models for fire departments across the country," says public health professor and center team member Jeff Burgess.

Those models include real-time research that uses blood and urine samples to show the need for fire crews to avoid toxin exposure by wearing protective gear at all times. Or peer-to-peer support for firefighters struggling with the mental toll of their work. Or even halting the spread of dangerous pathogens through the firehouse.

The work received a big boost in 2015 when UArizona received a $1.5 million grant from the Federal Emergency Management Agency, or FEMA, to help improve safety at Tucson Fire Department. A subsequent FEMA grant expanded that effort to fire departments across the country.

The Tucson Fire project began with a tragic loss. In 2014, fire investigator Tom Quesnel died from leukemia that was said to be caused by his work. His death prompted a re-examination of the department's safety regimen and a quest to identify why firefighters die from cancer at rates 14% higher than the general public.

UArizona's research revealed just how toxic burned material can be, even after a fire is out. "There are two sources of toxic exposure: breathing it in and absorbing it through the skin," Burgess says. "Together, these exposures cause changes at a cellular level that put firefighters at higher risk for cancer."

Those findings led to policy changes, such as requiring that all personnel, including investigators, wear respirators and other protective gear at the scene. The department also introduced the "clean cab" concept, which involves keeping contaminated fire-fighting equipment out of fire truck cabs as well as using wipes for exposed skin and routinely swapping contaminated hoods for clean ones.

Follow-up testing showed an immediate drop in toxins entering the bodies of firefighters.

Still, learning new habits, such as cleaning gear after a fire, was a challenge for weary fire crews, according to Tucson Fire Captain John Gulotta. "A lot of times our guys had been working all night and just wanted to get to get their gear off," he says. And more obstacles remain; although the reforms resulted in significantly lower contaminant levels, crew members are still absorbing some toxins. "I don't know if we'll ever get to zero," Gulotta says. "But what we *can* do is find whole bunch of little things to change."

Reducing toxic exposure isn't the only benefit from this UArizona/Tucson Fire collaboration. For instance, Kelly Reynolds, chair of the college's department of community, environment and policy, addressed TFD's problem with firehouse MRSA staph infections by advising that carpeting be replaced with easier-to-sanitize hard surfaces; soon, the problem disappeared.

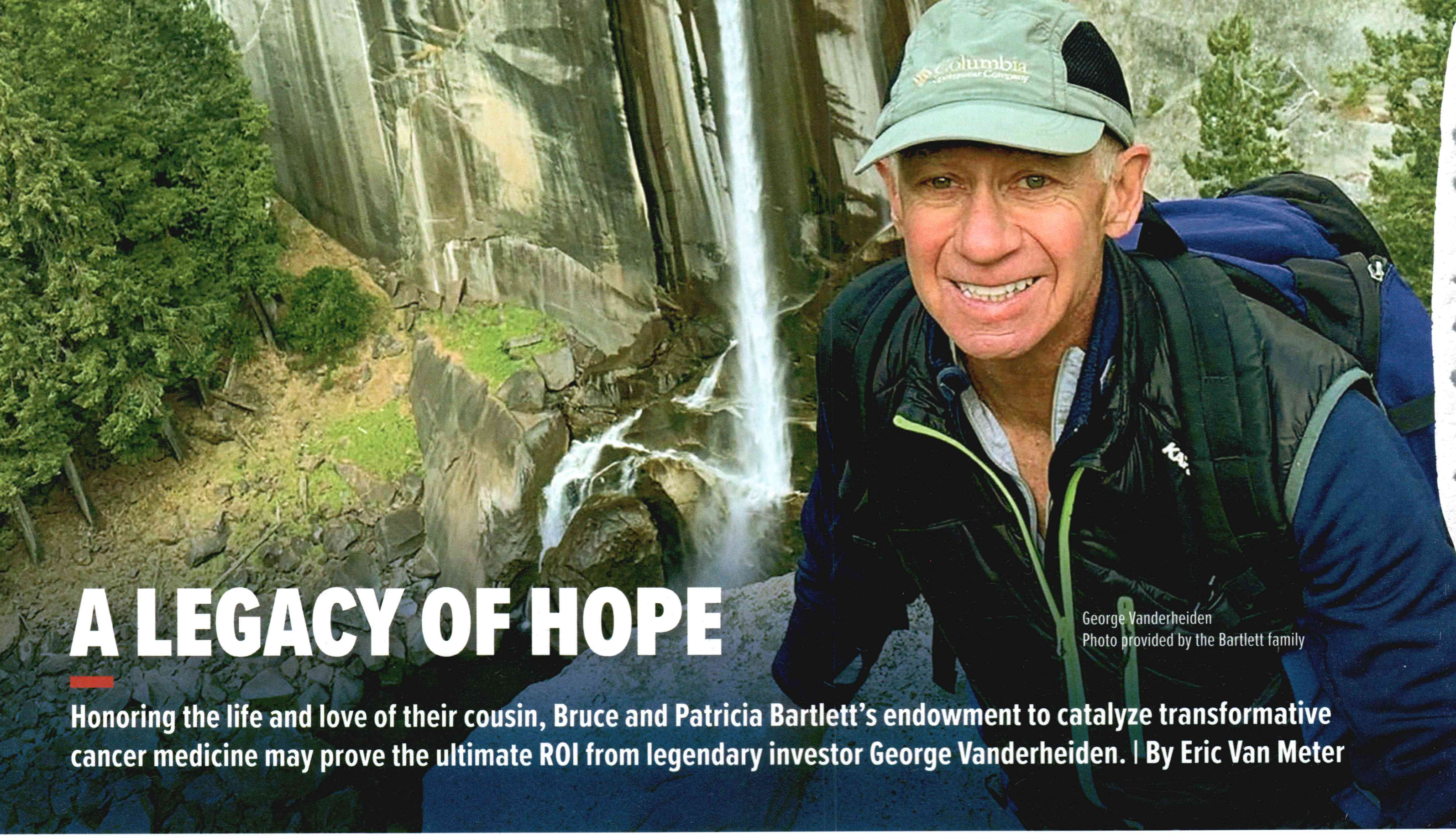
And Patricia Haynes, another Center for Firefighter Health Collaborative Research team member, has introduced cognitive therapy to help firefighters cope with the mental stress of 24-hour shifts, where sleep patterns are constantly under siege from late-night emergencies. She also created an outreach protocol that has firefighters initiating conversations with colleagues facing professional or personal difficulties.

Haynes likewise helped implement a program where firefighters temporarily go on a lighter schedule, allowing them time to deal with problems. "They are always subject to chronic stress," she says. "This policy allows them to reset and work on some of these issues so that they can get back out in the field."

It's just one more perk from the priceless partnership between the university and Tucson's first responders. "This collaboration is such a big thing," Gulotta says. "I don't know how we'd do it if the UA was not so generous in reaching out to us. They are making a huge difference."

'We're doing things that can provide models for fire departments across the country.'

Tucson Fire Department firefighters battle a major fire at a Tucson scrapyard amidst dense smoke in 2022. Exposure to toxins is a common hazard for firefighters. Photos: Kelly Presnell, Arizona Daily Star


George Vanderheiden
Photo provided by the Bartlett family

A LEGACY OF HOPE

Honoring the life and love of their cousin, Bruce and Patricia Bartlett's endowment to catalyze transformative cancer medicine may prove the ultimate ROI from legendary investor George Vanderheiden. | By Eric Van Meter

George Vanderheiden was a humble man — not one to talk about his achievements (there were many), not even with his closest confidantes.

"You'd never know what he accomplished," recalls Bruce Bartlett, Vanderheiden's cousin, though they were as close as brothers. "The only way I'd find out anything was because his mother would tell my mother, who would tell me. Trying to get it from George was like pulling teeth."

Vanderheiden died last October from a rare form of pancreatic cancer — one that is currently untreatable and for which not even clinical trials offered hope. In the wake of that loss, Bartlett and his wife, Patricia, chose to honor their cousin's life with a gift to fuel pioneering work that could save countless lives.

Their $3 million benefaction establishes the George A. Vanderheiden Endowed Chair in Cancer Immunological Research at the Center for Advanced Molecular and Immunological Therapies, or CAMI. CAMI is the University of Arizona Health Sciences' nascent biomedical research hub, charged with tackling some of the world's most intractable diseases. Its pioneering roadmap has the potential to make cancer, the second-leading cause of death worldwide, not just treatable but curable. And that's an investment that longtime fund manager Vanderheiden would no doubt deem blue chip.

The stuff of investing legend

Vanderheiden began working with Fidelity Investments in 1971, not long after earning his Master of Business Administration degree from Boston University. The company had some 200 associates at the time, and Vanderheiden initially opted for the path of financial analyst, unsure he'd do well as a stocks manager. It was, ironically, one of his worst misjudgments in a long and storied career. In fact, when Vanderheiden did become a fund manager, he ultimately proved to have a rare genius for investing.

Though an adventurer outside of work — he'd take his three daughters on whitewater rafting trips, safaris in Africa and climbing expeditions in Europe — behind the desk, he was known for GARP investing: Growth at a Reasonable Price. It was a moderate strategy, at times earning him the label "contrarian," but Vanderheiden was competitive at heart. He played to win, and for a span of 10 years, his investments outperformed those of every other fund manager in the country.

In his 19 years leading Fidelity's Destiny I fund, Vanderheiden achieved total returns of 2,781%, compared to 1,865% of the S&P 500 index over the same period. For decades, he calmly and steadily built a legacy that earned doffed caps across the investing world, not as a "wolf of Wall Street" but as someone whom coworkers described as "so cooperative" and "easy to work with." He loved honest success — his own or someone else's — and never caved to a zero-sum mentality. He mentored those around him with a genuine desire to help, and it made him all the better. In the words of a colleague, the famed fund manager Peter Lynch, "Quite simply, George is one of the best investors of all time."

The promise of precision medicine

"Giving is personal," Patricia Bartlett says, reflecting on the origins of her and Bruce's philanthropy at UArizona. The couple began supporting education after their son, Benjamin Bartlett, graduated from the university in 2010. It was through early conversations exploring the dearth of medical diagnoses for youth with learning and attention differences that the Bartletts first connected with Michael Dake, senior vice president of UArizona Health Sciences, who is leading the development of CAMI.

Sadly, the Barletts' connection to CAMI's work was personal even before Vanderheiden's illness and death. Bruce's father and one of his brothers died of cancer. Patricia's brother, also deceased, received hormone therapy that dramatically improved his quality of life in his final years. Hormone treatments alter the cellular processes of disease and are one class of the molecular therapies at the heart of CAMI's mission, built on growing evidence that cell- and gene-based interventions capitalizing on the body's innate systems offer the best measures for fighting disease.

Immunotherapy, CAMI's other focus, is one of today's most promising approaches to cancer treatment — one with the potential to bypass the side effects of even gold-standard interventions that too often compromise long-term health and wellness. Classic immunotherapies such as vaccines are already being tested for certain cancers, and CAMI scientists could one day identify biomarkers that help determine highly precise molecular and immunotherapy interventions tailored to individual patients' unique biological makeups and needs.

A commitment to giving back

The Bartletts, like Vanderheiden, didn't grow up with money. In college, Bruce Bartlett and Vanderheiden advertised in the town paper to paint, wash windows and do other odd jobs for extra cash. Bruce got through college on student loans, as did Patricia, who worked her way through school as a waitress. The two became teachers — as did Patricia's best friend, Sharon, who made a fourth for double-dating and eventually became Vanderheiden's wife.

Each couple had three children, and many summers were spent with all of them together at the Vanderheidens' house on New Hampshire's Lake Winnipesaukee. And the families shared a close-held belief that shaped their trajectories, as well as the lives of many more.

"Since there is nothing we can take with us from this life," Vanderheiden once said, "we should try to leave behind as much as possible. Those who have been successful have an even greater responsibility to make an impact with our time, talents and resources."

Vanderheiden took that responsibility seriously. His wife recalls that he would read a newspaper story about someone in need and just send them money, especially if doing so helped a child. Vanderheiden's passion for pickleball, sparked during winters in Arizona, gave rise to courts across their New Hampshire hometown of Wolfeboro. And regional charter schools are $14 million stronger thanks to the Vanderheidens' commitment to education.

The causes they supported reveal a generosity and compassion moved by so much need in the world: mortgage-free homes for families of fallen military service members and first responders, adaptive sports for people with disabilities, safety and wellness programs for pregnant women struggling with addiction, youth education-to-employment programs in Kenya. The list goes on, and these are only the Vanderheidens' direct acts of philanthropy.

"In an indirect way, he probably helped a few million people with their retirement and quality of life," Bruce Bartlett notes. It's an idea also expressed by one of Vanderheiden's colleagues in reply to an article celebrating his legendary work: "We all want to leave a legacy. George probably had a family and an amazing personal legacy, but he also has a legacy for thousands of people he will never meet."

Indeed, it's impossible to know how many lives have been touched by the ripples of Vanderheiden's investing acumen. How many families, confident in the health of their growing savings, could pay for their kids to go to college? How many food banks, animal shelters and fraternal orders of police benefited with small-scale donations from households he'd helped make financially secure? How do we tally the magnitude of that impact over a 30-year career and moving forward?

A final gift

Two months before his death, Vanderheiden wrote to Bruce and Patricia about his decision to forgo another round of chemotherapy. The treatment, which had proved ineffective, damaged organs, fogged his brain and wracked his body with pain, chills, cramps, fatigue and a host of other ailments — the very complications of treatment that might someday be eradicated by research under the CAMI chair that now bears his name.

"My appetite has returned, and food is now enjoyable again," Vanderheiden shared. "I am no longer staring down a dark rabbit hole, but instead I'm looking with joy at the blue waters of Lake Winnie. I am not saying stupid things and forgetting friends' names, but instead staring into their eyes and seeing caring. This clarity of thought reminds me that people are far more important than any other thing in your life."

It was one last gift of the mentoring that came naturally to Vanderheiden: sharing what he was learning and, in the process, giving the people he loved a small shelter of peace against the loss they were facing. That letter also included a challenge to himself — a kind of echo rippling forward from the beginning of his life some 76 years before.

Vanderheiden's father was serving in World War II on USS Eagle 56 when the patrol boat was sunk off the coast of Maine on April 23, 1945. He never got to hold George, his newborn son.

"My daughter will give birth to her fourth child in a short time, and I want to go out not fighting one of life's curses, but holding a new life in my arms," Vanderheiden wrote to Bruce and Patricia in closing his letter. "That is my new goal."

Vanderheiden met the goal he'd set for himself. Before his death, he held his 3-week-old namesake, Georgia.

ENERGY INNOVATION

Halley Hughes
Photo: Chris Richards

Household energy use changes with rising temperatures. | By Shelley Littin

Humans, like all mammals, expend energy to keep their internal temperatures within a healthy range. Modern human cities do the same thing — because we built them that way.

A study published in the journal PLOS Climate in April takes a new look at how household energy use changes with rising temperatures, applying a model traditionally used for studying animals.

For urban planners, energy companies and emergency managers, the work has implications for energy grid security, cost predictions and saving lives from heat waves. And for Halley Hughes '23, who is the study's lead author, the project is the culmination of her undergraduate career as a research assistant in the Bridging Biodiversity and Conservation Science program at the University of Arizona's Institute for Resilience, or AIR.

Hughes began the work that led to the journal article at the height of the pandemic lockdowns. She was bored and had, she says, "that itch to do research." The work has been a stepping stone on her path to helping communities become more resilient in the face of environmental change.

Hughes applied an approach that treats buildings — and, on a larger scale, cities — as if they were living things. In a way, she says, it makes sense.

"Humans made buildings, and we use buildings to maintain a normal temperature for us. To do that, the buildings use external energy in the form of fossil fuels or, if you're lucky, alternative energy sources," she says.

‘The internships and scholarships provided by our program empower students with real-world experiences, teaching them the ways in which they can make meaningful change in their communities and across the globe through science and environmental communication.’

The approach was pioneered by Richard Hill, a now-retired biologist at Michigan State University who applied a mathematical model for studying how mammals regulate their body temperatures to an entirely new area: investigating how human-made infrastructure uses energy in the same way to regulate internal spaces in cold climates.

Previously, Hill’s model had only been evaluated in cold and moderately warm climates. Hughes’ study extends Hill’s work to look at the effects of hot weather on energy use in buildings.

“Dr. Hill looked at cold places,” she says. “We looked at all of Arizona, which includes cities that can get as hot as 120 degrees Fahrenheit.”

Hughes used publicly accessible data from 10 large energy companies in Arizona to look at energy usage in relation to outside temperature for a large majority of the state’s population. Her results show that buildings require more energy to regulate internal temperatures when it’s hotter. Hughes has demonstrated that merging science disciplines to study urban energy consumption can give city planners effective tools to prepare for high temperatures.

A key benefit of this work is that it can be used to predict future energy needs, Hughes says. For energy companies, she explained, knowing the energy needs of a service area in advance could help prevent events such as rolling blackouts.

“The general pattern documented here and its match to the more general theory is really exciting and powerful to see,” adds her mentor, Dave Breshears, a Regents Professor in the School of Natural Resources and the Environment.

Hughes also found indications of energy insecurity in lower-income neighborhoods by comparing per capita income from census data to her map of energy use.

“In these places, people likely are delaying turning on their energy to save money,” she says, “which could be increasingly dangerous if energy costs and temperatures continue to rise.”

Study co-author Ladd Keith, a UArizona assistant professor of planning and sustainable built environments in the College of Architecture, Planning and Landscape Architecture and a faculty research associate at the Udall Center for Studies in Public Policy, agrees.

“This study provides important context for heat planning and governance as heat risk in our communities continues to increase due to climate change,” he says.

Hughes, an honors student, graduated in May with a double major in global change ecology and urban and regional development from the College of Agriculture and Life Sciences. Her honors thesis investigates the impacts of heat on energy use in manufactured homes in Tucson.

She hopes her experience in research and early publication can help inspire other undergraduate students to get involved in science as well.

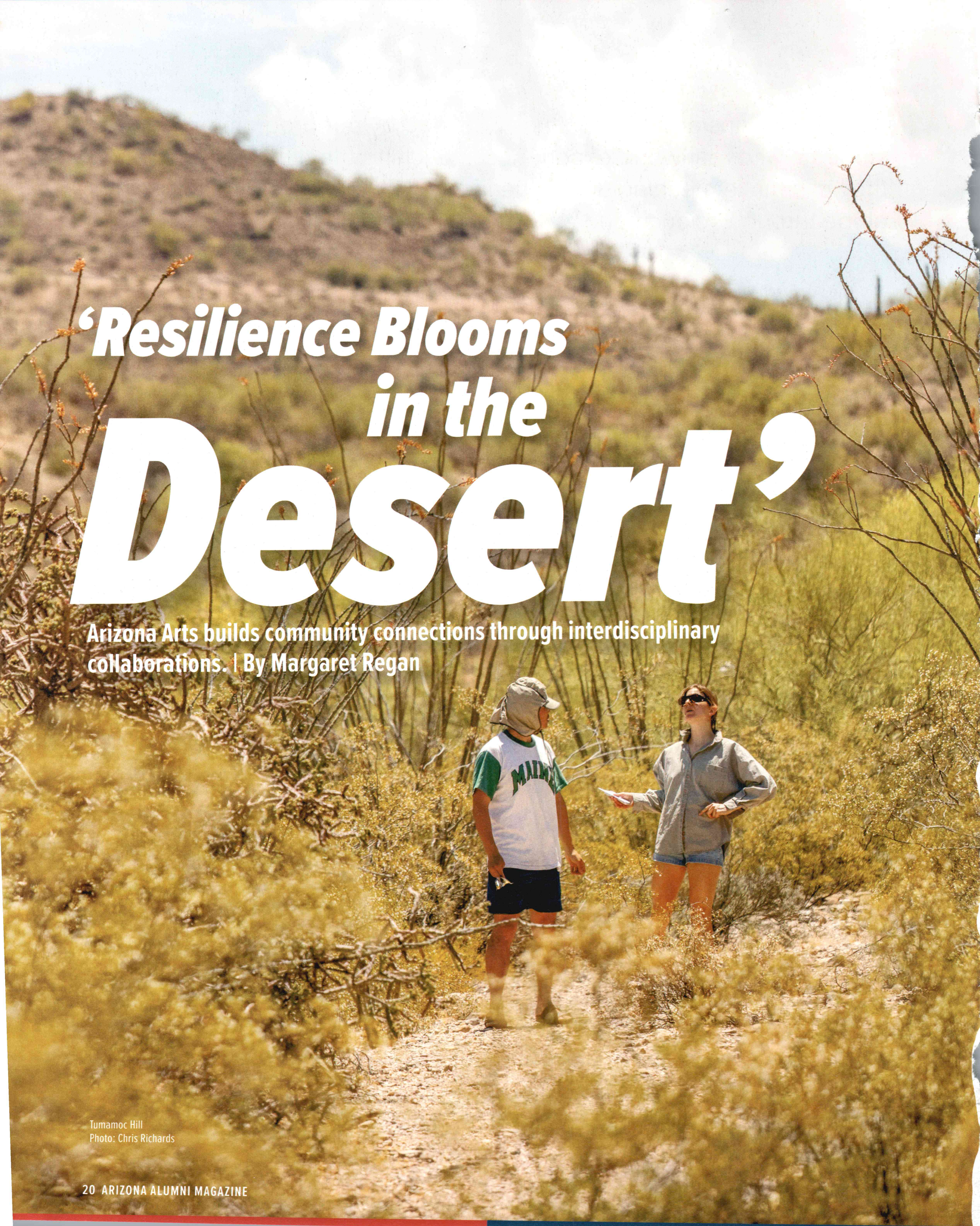
“Undergraduates should not be intimidated by research,” she says. “It’s an empowering process, and there are so many opportunities at the University of Arizona to be involved in science.” To her fellow undergraduates, she suggests: “Don’t hesitate starting research just because you’re an undergrad. You can author a paper, too.”

The UArizona Undergraduate Research Task Force aims to connect all university students with diverse research opportunities.

In addition to her love of science, Hughes also is passionate about science communication, an interest she furthers as a Liverman Scholar with AIR’s Education Initiatives and as an award-winning correspondent for Planet Forward, a project of George Washington University that promotes environmental and science storytelling through a variety of media. She also is co-director of UArizona Students for Sustainability and an advisory team member for the university’s new Sustainability and Climate Action Plan.

“Halley’s work is a perfect example of how our resilience initiatives in AIR aim to combine education, research and impact,” says Kevin Bonine, director of AIR’s Education Initiatives program. “The internships and scholarships provided by our program empower students with real-world experiences, teaching them the ways in which they can make meaningful change in their communities and across the globe through science and environmental communication.”

Hughes plans to pursue a master’s degree in communication and community innovation at the College of Agriculture and Life Sciences.



‘Resilience Blooms in the Desert’

Arizona Arts builds community connections through interdisciplinary collaborations. | By Margaret Regan

Tumamoc Hill
Photo: Chris Richards

On a balmy Saturday night in May, the sound of mariachi fills the air. Music students from Sunnyside High School are singing joyous songs in Spanish. Three young women dressed in bright yellows, blues and reds are performing folkloric dances of Mexico for a lively audience of friends and family, local politicians, and neighborhood activists. Everyone in the crowd is loving it.

The fiesta at El Pueblo Neighborhood Center in Tucson celebrated a long effort to revitalize the site and honor the people of the city's south side. Beginning in 1975, the center was a hub of community and family activity, a site for everything from weddings and quinceañeras to a preschool and a library. Recently, however, use of the center for such communal activities had declined.

Around 2017, things began to change. Congressman Raúl Grijalva moved his local offices there, and the city government joined a number of neighborhood organizations to begin reinvestment. In the past year, a trio of University of Arizona scholars and a large group of their students also joined the effort to revitalize the center.

Ellen McMahon '83, associate dean of the College of Fine Arts, tells the story of how the university got involved through the Arizona Institute for Resilience, or AIR. The institute focuses primarily on environmental issues but this year provided $75,000 in grant funding to the College of Fine Arts to increase its engagement with the arts and humanities. Called Arts|Humanities|Resilience grants, the awards support projects that use AIR research methods to build resilience in individuals and communities.

"It was really great," McMahon says. "These interdisciplinary collaborations illustrate the inherent ability of arts research to transcend disciplinary silos and create meaningful connections with communities."

The grants have supported five multidisciplinary projects with collaborations that ranged from visual arts, photography, documentary film and creative writing to museum studies, public humanities, architecture and climate science. Among the projects, scholars paired up to focus on work at El Pueblo and at Tumamoc Hill on Tucson's west side.

"Documenting Resilience in Tucson's Southside," for instance, enabled three UArizona scholars — Meg Jackson Fox, curator at the Center for Creative Photography, or CCP; Jacqueline Barrios, assistant professor of public and applied humanities; and Kenny Wong, lecturer in sustainable built environments at the School of Landscape Architecture and Planning — to continue the work highlighted at the fiesta with the El Pueblo neighborhood's residents.

"We were really interested in using photography and the arts more broadly as a tool within community work," Jackson Fox says. "How can photography participate in what it means to build a community?"

In partnership with the CCP and the Sunnyside Foundation, Barrios created the undergraduate class "El Pueblo Urban Humanities Studio." Students researched their own projects and collected oral histories from community members and leaders, including Grijalva.

Wong, the third member of the trio, devoted his undergraduate capstone seminar for architecture majors entirely to El Pueblo. His students created model designs that reimagined the buildings and landscapes around the center in ways that would make them sustainable.

The trio worked closely with two community artists-in-residence for the project, funded by AIR. Muralist Jessica Wolff '23 collected old family photos of the neighborhood and turned them into collages.

On the night of the party, the collages went on display at the center for all to see, to the delight of audience members who recognized friends and family in the images. In another room, Luis Fernando Gonzalez's video documentary about the early years of the center was projected. Later, Jackson Fox exhibited selections of the student and community work at the CCP.

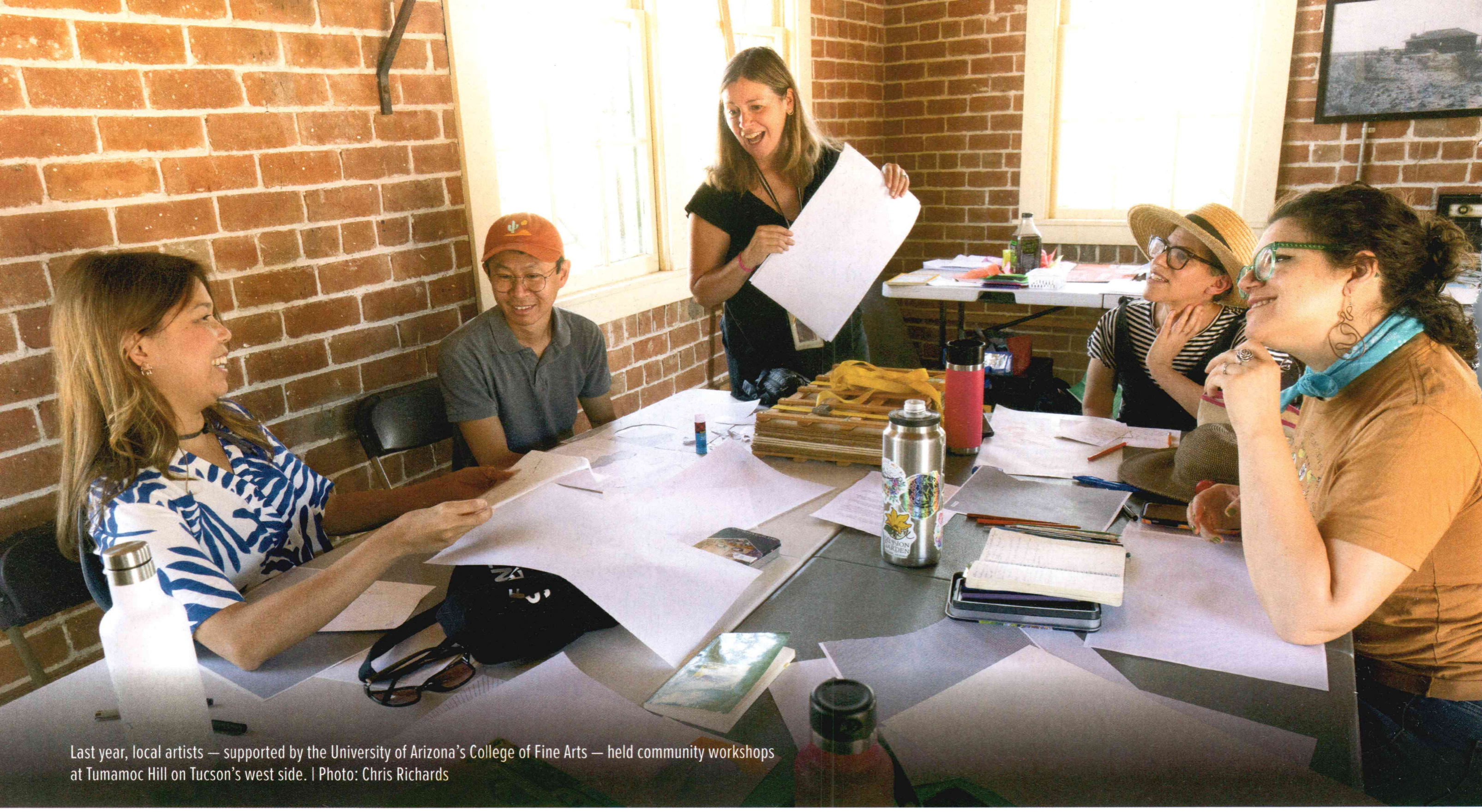
As Barrios puts it, "We all tried collectively to tell the story of El Pueblo and what it means to be from this place."

Six miles north of El Pueblo, Tumamoc Hill is used daily by scores of walkers who brave the steep 1.5-mile road that climbs 700 feet above West Anklam Road. At the top, they are rewarded with stunning panoramic views of the Santa Cruz Valley and the city. The hill, covered with gigantic saguaros and a forest of ocotillos, creosote and mesquites, is a reserve for all kinds of birds and desert animals.

Tumamoc has hosted a desert laboratory since 1903, and in 1956, UArizona purchased the reserve and became the hill's steward. Many, including McMahon, think it's a perfect place to bring the arts, sciences and humanities together through poetry, photography and climate studies. When McMahon learned that artist and experimental philosopher Jonathon Keats was working on a project there, she suggested he team up with Carissa DiCindio, a UArizona assistant professor of art and a specialist in museum studies. Their proposal, "The Nature of Change: Experiments in Societal Transformation through Environmental Art in Tucson and the Sonoran Desert," was funded by the grant program.

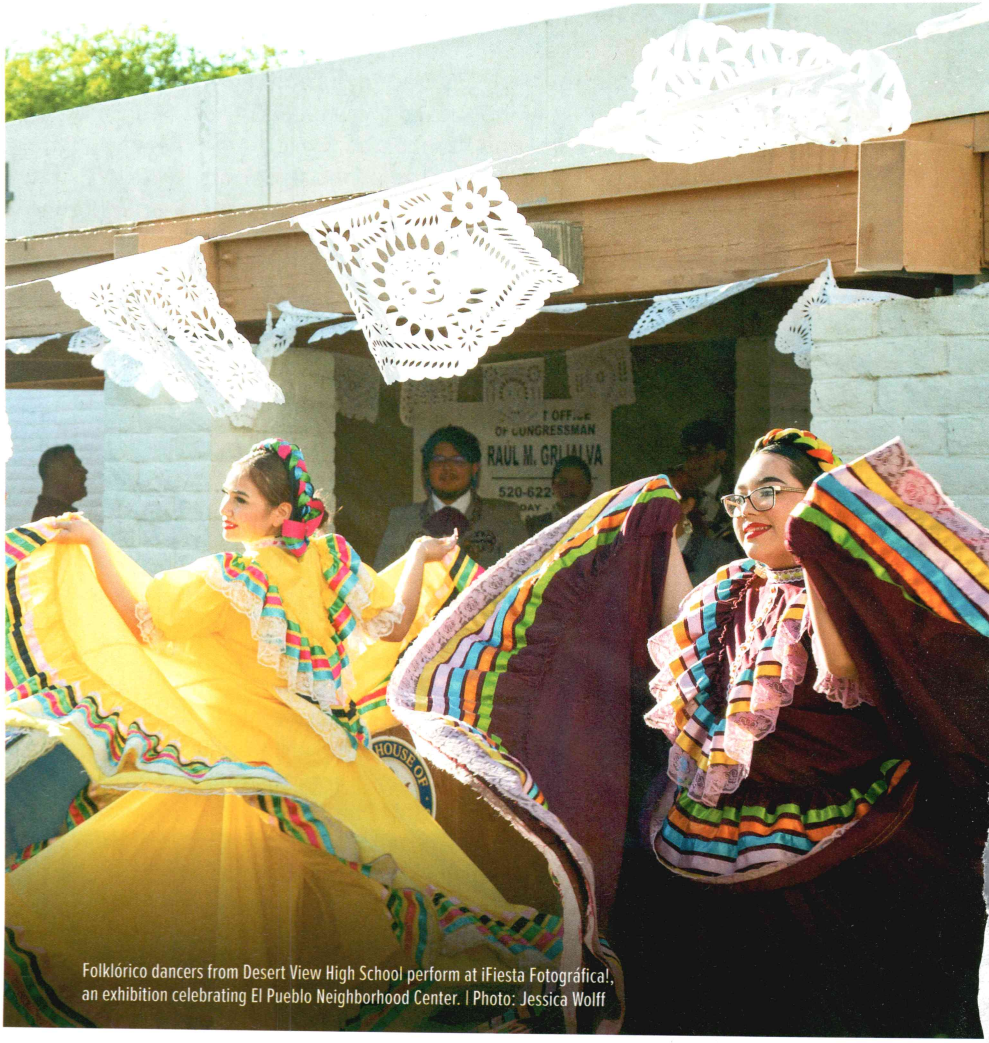
Keats is known internationally, especially for his work in deep-time photography. One of his methods is the pinhole camera, a technology dating from the fifth century B.C. that joins science with art in a simple device anyone can make.

In May, Keats and DiCindio held a community workshop at Tumamoc for participants to make their own pinhole cameras. "We were given little wooden



Last year, local artists — supported by the University of Arizona's College of Fine Arts — held community workshops at Tumamoc Hill on Tucson's west side. | Photo: Chris Richards

> 'The whole point, really, is to invite people to think about time differently by thinking 100 years into the future.'



Folklórico dancers from Desert View High School perform at iFiesta Fotográfica!, an exhibition celebrating El Pueblo Neighborhood Center. | Photo: Jessica Wolff

UArizona students, faculty and staff and community storytellers gather at El Pueblo Neighborhood Center at the conclusion of a site visit facilitated by the Sunnyside Foundation and the Office of Congressman Raúl Grijalva. | Photo: Netza Aguirre

boxes, about three or four inches square," McMahon says. "He drilled holes in each of them and gave us a small piece of copper that had a more durable hole and then a black piece of paper. We cut the paper to the right size and glued the metal pinhole and paper onto the inside of the camera."

Unlike a camera with a shutter, a pinhole camera can function in place for long periods of time. The workshop participants did not keep the cameras they constructed — instead, they were to place them somewhere in the city and leave them there for a hundred years. The cameras, of course, would outlive their makers, so participants were asked to find a caretaker, who in turn would also pass the job on.

The plan is that the cameras will be retrieved in 2123, and the photographs will go to the CCP. Keats hopes that people of that time will be able to see images that will have recorded changes in the landscape.

"The whole point, really, is to invite people to think about time differently by thinking 100 years into the future," McMahon says. How are the saguaros doing now? How will they look a hundred years from now? And perhaps people will think, she says, "What can I do to make sure, in a time of climate change, that these beautiful cacti are still here?"

For another project last year, Keats collaborated with Regents Professor Ofelia Zepeda, a Tohono O'odham poet and linguist, and Raquel Gutiérrez, a Tucson-based poet. They called the project "Future Climate Proverbs." Each of them wrote interactive prompts for proverbs that for a time were displayed on slates along the pathway on Tumamoc. With the new funding from AIR, Keats and DiCindio held a workshop for community members to write environmental proverbs of their own.

"There are some proverbs that apply to every place all around the world," Keats says. Like "red sky at night, sailors' delight."

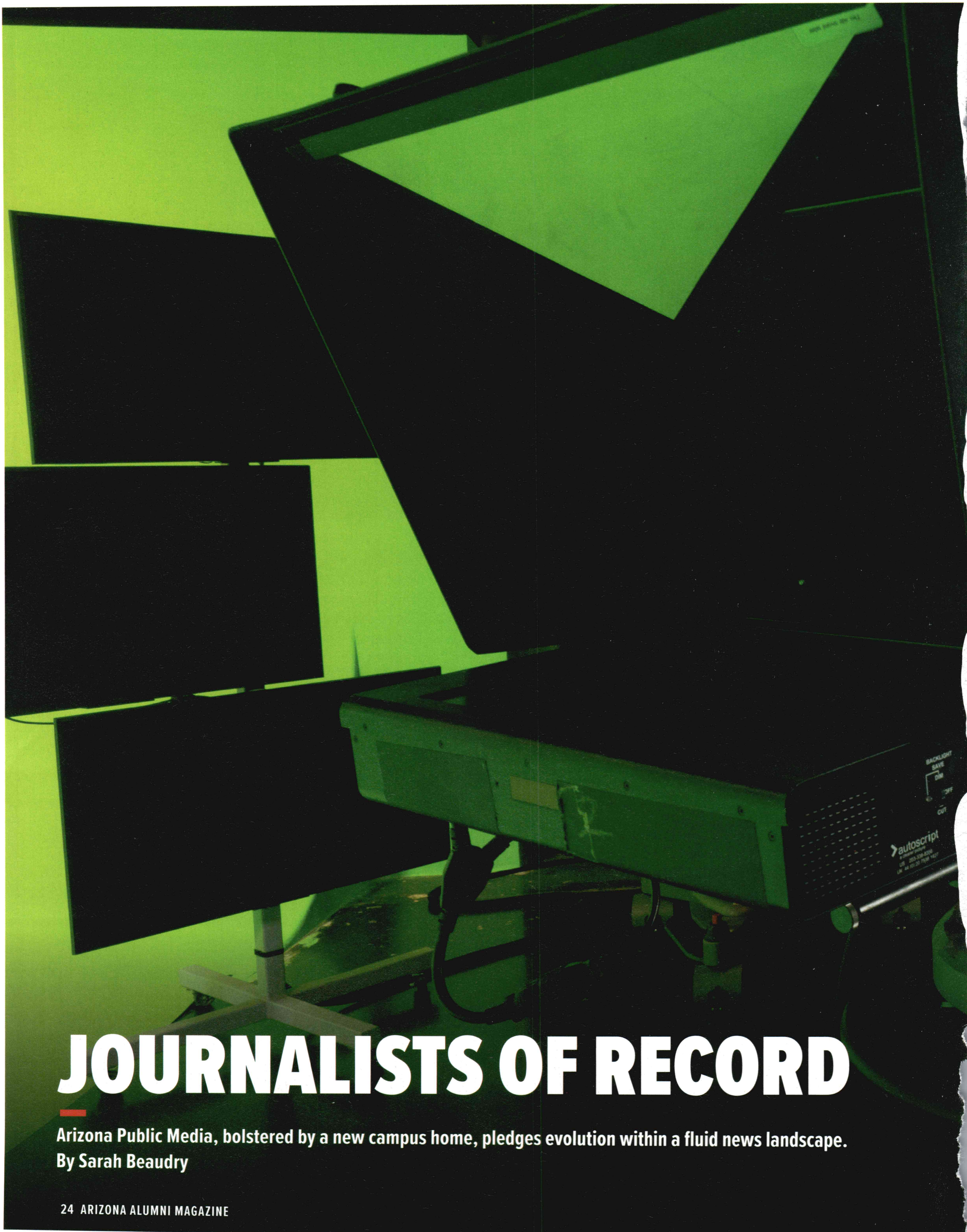
"And then there is the possibility of creating new proverbs," he continues, like proverbs about climate change and the environment.

For the proverbs workshop, participants also gathered at Tumamoc. They were invited to climb the hill, to walk among the ocotillos and saguaros, and to get inspired to write proverbs of their own. Some walked in groups, some walked alone, but everyone wrote poetic meditations about nature. Here are two:

Admire the mother roadrunner,
spreading her wings in flight.
Yet beware she's coming straight at you,
protecting her baby from the world.
by Jenny Fiero

The shade of a big tree can stunt
or foster community.
Resilience blooms in the desert.
by Ellen McMahon and Carissa DiCindio

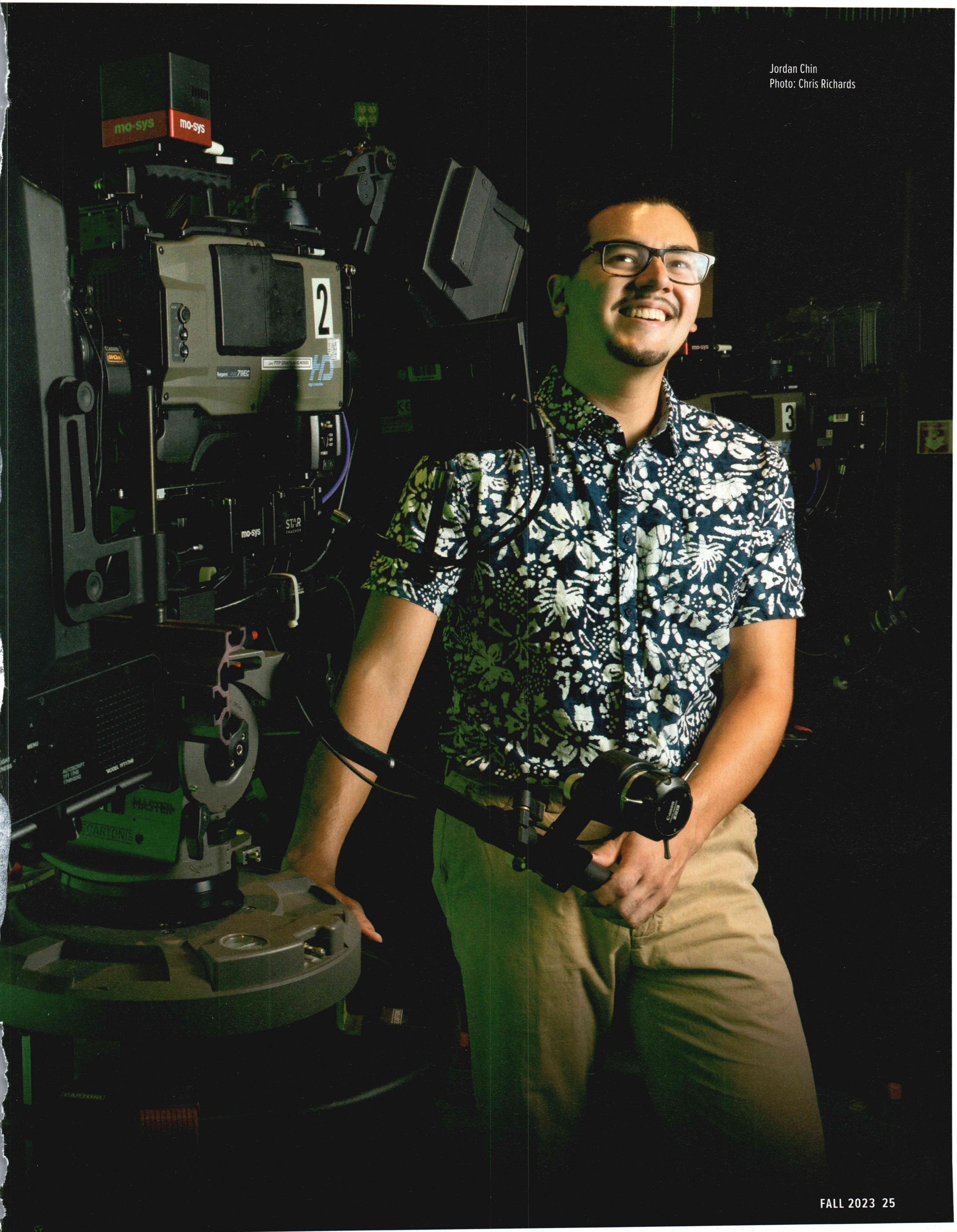
The Center for Creative Photography plans an exhibition in October 2023 featuring the five projects sponsored by AIR.



JOURNALISTS OF RECORD

Arizona Public Media, bolstered by a new campus home, pledges evolution within a fluid news landscape.

By Sarah Beaudry



Jordan Chin
Photo: Chris Richards

When public television released “Sesame Street,” co-created by University of Arizona alumna Joan Ganz Cooney ’51 and first broadcast in 1969, characters like Big Bird and Cookie Monster helped educate Gen Xers and prepare them to move into the classroom.

“Public media started out as educational radio and television back in the 1950s, supporting instructional activities largely for schools and universities,” says Jack Gibson, the CEO of Arizona Public Media. According to Gibson, KUAT Channel 6 began operations in 1959 as Arizona’s first public station. In Tucson, unlike much of the country, radio came after TV, largely as an outgrowth of initiatives like “Sesame Street,” with KUAT-AM offering classical music to local audiences in the mid-1970s.

Today, AZPM is a not-for-profit organization serving the Southern Arizona community as a service of UArizona. Recent years have seen the advent of digital programming created specifically for digital and social media platforms in response to rapidly changing audience needs and preferences.

Gibson has enjoyed 47 years in the industry and 18 years at AZPM, where he has overseen the production of 23 original documentaries, four community interactive multimedia events and more than a dozen special television projects and series. Among them, “Arizona Illustrated” is one of the longest-running series on public television anywhere. He also has led several original radio news programs and online educational projects.

Gibson says it’s the local stories he remembers most — programs like “Phoenix Mars Mission: Ashes to Ice” and its sequel, “Onto the Ice,” “Arizona’s Dust Bowl: Lessons Lost,” and “Arizona and the Vietnam War.” He recalls meeting Holocaust survivors last year at a local screening of Ken Burns’ “The U.S. and the Holocaust,” which aired nationally on PBS.

“It stunned me that there were a number of survivors in the audience,” he says. “They were children at the time and survived under harrowing circumstances.”

AZPM quickly put together a series capturing their stories: “Children of the Holocaust,” a living-history project, included 19 first-person accounts of the Holocaust from survivors living in Southern Arizona. Their recorded stories are now available in perpetuity for school groups and for use by Tucson’s Holocaust Museum, as well as available online at azpm.org.

Although AZPM’s primary focus is community service, disruption in the media landscape — including how we watch, listen to and make content — has changed how the organization works. Add in a pandemic, and the media group has continued to shift its priorities. For one thing, while AZPM has always been involved in journalism, Gibson believes it’s going to increasingly become the centerpiece of public media — a place where audiences can trust the information that’s presented. “Our role isn’t to convince you of anything but to lay out the facts so that you can make informed decisions and understand issues at their core,” he says.

Leslie Tolbert agrees. She recruited Gibson to the university in 2005 and is now the volunteer host of the radio show “Arizona Science,” where she regularly shares five-minute interviews with UArizona researchers. The show airs during breaks in NPR’s broadcast of “Science Friday.” “There’s no question that AZPM, NPR and PBS are trying to be neutral arbiters of complex stories,” says Tolbert, former senior vice president for research and Regents Professor emerita in neuroscience at UArizona. She recently concluded six years of service on a board overseeing academia at her alma mater, Harvard University, where she says she was proud to represent the University of Arizona as a public research entity.

“We’re an international university, but our community ties are very strong,” she says, adding that she loves sharing science stories with the public. “AZPM is bringing the science of UArizona to our local community. People in the grocery store will say, ‘I heard you the other day talk about what’s happening with water in Tucson.’ I love that.”

When the coronavirus pandemic hit, AZPM quickly shifted to provide educational programming, with a focus, Gibson says, on “What can we do to help the community?” In the early days of the pandemic, the organization stopped all documentary and magazine series production to focus on helping the community understand what was going on. They developed and produced public service announcements in real time, partnered with UArizona medical and public health researchers to educate the public, created learning programs for school-age children to help families whose kids were suddenly at home, and broadcast those programs on the three television channels at their disposal. One channel targeted preschool to elementary school learners, another focused on middle school curricula, and the third focused on content for high school students. All programs were based on standards set by the Arizona Department of Education.

The pandemic also advanced changes in streaming services. When streaming entered the marketplace, Gibson says, it was predicted that the amount of streaming would be on par with the amount of broadcast television by 2024, but it has already far surpassed that. At one time, AZPM averaged 500,000 minutes of content streaming a month; today, it supports more than 4 million minutes a month.

And the media industry remains in flux. In February, NPR announced that it would lay off 10% of its workforce — at least 100 people — and eliminate most vacant positions. In announcing the cuts, NPR CEO John Lansing cited the erosion of advertising dollars, particularly for NPR podcasts, and the tough financial outlook for the media industry more generally. Meanwhile, locally, the Arizona Daily Star reduced its newsroom staff by 25% in April.

“Tucson is in real danger of becoming a news desert,” Gibson says. “It really puts the pressure on us to step up our journalism game. And to do that, we’re going to have to have the resources in place — both financial and physical resources — to be the journalists of record in this region if necessary.”

At the moment, AZPM is housed in a basement and sub-basement of a classroom building on UArizona's main campus. The location, limited space and outdated technology make it difficult for AZPM to expand its public service mission, engage the community and recruit talent and donors. But a much-needed upgrade to its physical space is in the works: The Arizona Board of Regents recently approved a plan to build the Paul and Alice Baker Center for Public Media at the University of Arizona Tech Park at The Bridges. The new facility, which will be 100% donor funded, is scheduled to break ground in February 2024.

The Baker center, named for alumni who are longtime supporters of the university, will accommodate an audience of at least 200 people, provide space for community forums and lectures, and expand on-location production capability with digital and emerging technologies. In AZPM's current facility, "the acoustics are not at all sufficient for what we're trying to do," Gibson says. "Air conditioning kicks on during interviews and makes audio production much more challenging. The goal is to make the local productions easily migrate to national stages. In terms of the current facility, that's been a challenge."

Jack Gibson
Photo: Chris Richards

The strategy is to create a physical space that staff, students and donors can be proud of and that will attract commercial clients. It will house AZPM's team of more than 100 professionals and 30 to 40 students. Since 2011, AZPM staff members have won 218 Emmy Awards. AZPM also won the coveted Overall Excellence Award in 2015 and the Governor's Award in 2016.

"Think about our students, and what an opportunity for them to come in and work on a project for a commercial production company shooting at our new facility," Gibson says. "What a great thing for their resume and an opportunity to learn how commercial production differs from public television and radio production."

AZPM's student employees (who make up 25-30% of the staff) work alongside the professional staff, some editing on their own, directing productions, and scripting — performing tasks significantly beyond entry-level work. Several AZPM student employees have been recognized with Emmy Awards in the four-state Rocky Mountain region.

Jordan Chin, who graduated in May with a bachelor's degree in broadcast journalism, began working at AZPM as a student in January 2019. At the time, he was a computer science major, but he had dabbled in television and was interested in returning to it.

Chin was the first recipient of Olesen Davis De Dios' Carol & Cecil Schwalbe Science Multimedia Scholarship in the School of Journalism, and in 2021 he was recognized with his first Rocky Mountain Emmy for an "Arizona Illustrated" segment called "Hearing Isaiah" about Tucson environmentalist Isaiah Haley, who is a "cause for hope and optimism about a clean, safe, and more sustainable future," according to the summary on AZPM's website.

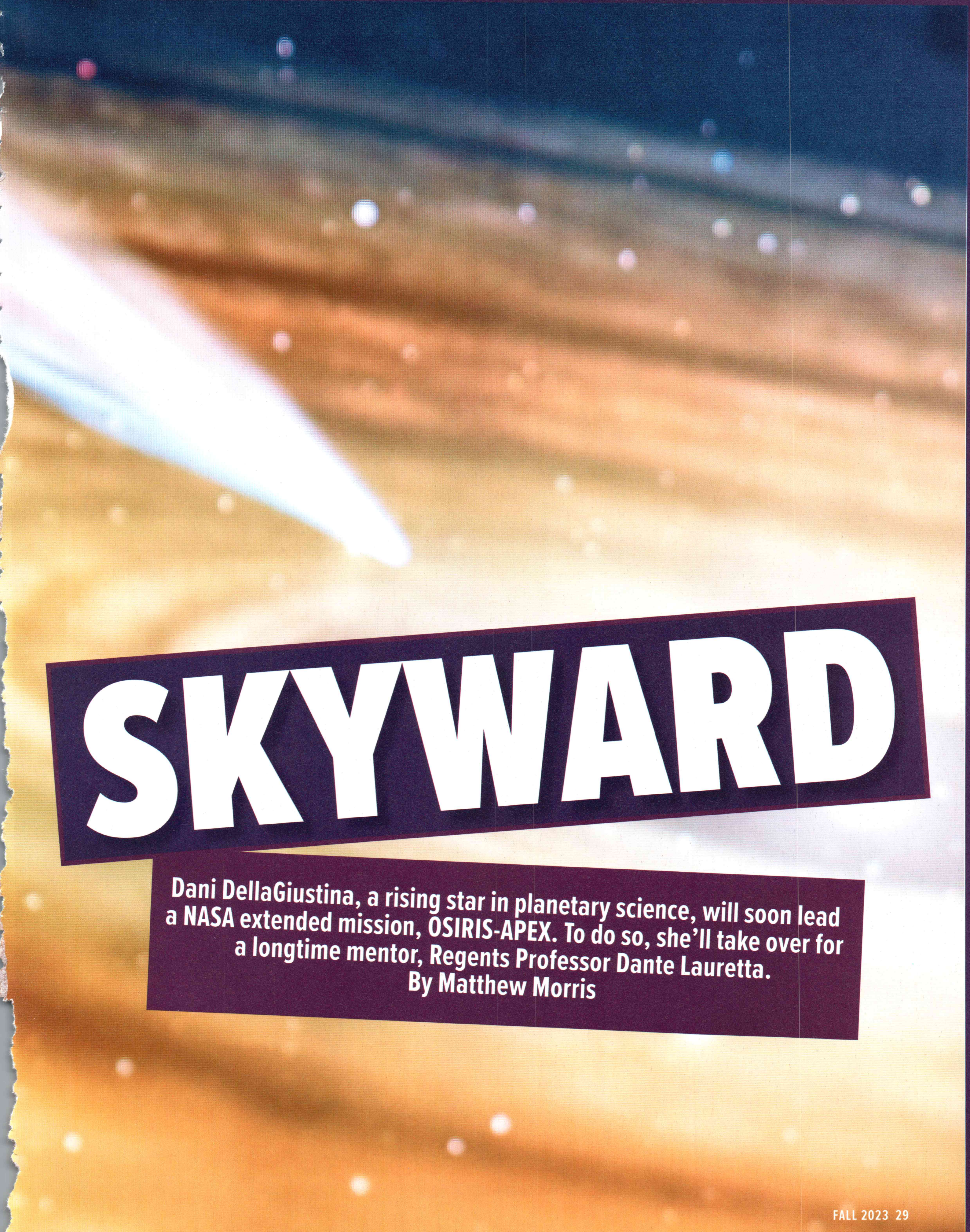
Chin was nominated for three Emmys that year, and he says he didn't expect that story to win. "I would have liked the one called 'Reconciliation on the River' to win," he says. That segment was about naturalist and conservationist Angel Breault and a team of volunteers who cleaned up trash, removed invasive species and reseeded native plants on a stretch of the Santa Cruz River near downtown Tucson.

"That was the story that made me want to switch majors," Chin says. "I was shooting that day. The producer, Mitch Riley, says, 'In a minute, we're going to set up to interview Angel and, Jordan, you're going to ask the questions. You're going to interview him.' I was thrown, I wasn't prepared, and I was really nervous. But I did it. I didn't do a great job, but I did it.

"But then I started having this conversation with somebody about why they do what they love. And that was the spark." Less than a week later, he changed his major. Today, he plans to continue working at AZPM as he pursues his master's degree and a career in broadcast journalism.

Long after he started in public media, Gibson is looking to the future, too. "I'm humbled and honored to be part of building a new space," he says. "But the objective of the new space is not the building: It is what this organization will be poised to do from that space that drives me forward. What I want to see in the rearview mirror when I retire is sustainable growth and something we can all be proud of. I hope to continue to be AZPM's No. 1 cheerleader."

Dani DellaGiustina, deputy principal investigator of NASA's OSIRIS-REx mission, speaks at the SXSW Festival in 2022. | Photo: Kyle Mittan



SKYWARD

Dani DellaGiustina, a rising star in planetary science, will soon lead a NASA extended mission, OSIRIS-APEX. To do so, she'll take over for a longtime mentor, Regents Professor Dante Lauretta.

By Matthew Morris

In the beginning, Dani DellaGiustina '08 '21 hoped to study philosophy and foreign languages. She'd grown up in the desert Southwest, moving around for her father's military career, with early years in Hereford and Sierra Vista, Arizona, preceding a middle-school move to El Paso. In the borderlands, she marveled at the clear night sky. But she didn't yet know about astronomy or planetary science, the discipline she'd later rock.

At 16, DellaGiustina enrolled in an introductory astronomy course at El Paso Community College. Philosophy, she found, resided in the cosmos. And many of the "big questions" could be pursued through the space sciences — questions about humanity's past and future, questions we pose in a thousand ways: tarot cards, tea leaves, archaeological digs.

She soon transferred to the University of Arizona to study astronomy. Here, she met Dante Lauretta '93, who would become a mentor, colleague, friendly rival and just plain friend.

Today, the two planetary scientists and professors lead a NASA mission, OSIRIS-REx. The spacecraft of the same name is shuttling through space with a half-pound sample of a carbon-rich asteroid, Bennu, in tow. On Sept. 24, the craft will pass over the Utah desert and drop it, via parachute, to Earth — a first for the United States.

Before all that, a great deal had to happen — for the scientists as well as for their mission.

* * *

They met in 2004. DellaGiustina, then a first-year physics major still drawn to outer space, signed up for a 1-credit colloquium about meteorites through the Lunar and Planetary Laboratory. Lauretta, recruited to teach at his alma mater by the late Michael Drake — then the director of the LPL, a post he would hold until his death in 2011 — told the students about research opportunities in his cosmochemistry lab.

"Email me," Lauretta said. DellaGiustina did.

In the lab, she started small: polishing meteorite samples, dumping used chemicals. "It was a job," she says. But spring also brought an independent study, with Lauretta, on meteorites and the birth of the solar system. And a project that imagined asteroids as radiation shields for astronauts flying to Mars earned her a NASA Advanced Concepts fellowship for $10,000. Lauretta served as adviser.

During her college years, DellaGiustina also wrote a peer-reviewed paper and became involved with OSIRIS — the university-led proposed mission that came before OSIRIS-REx, which was steered by Drake but ultimately did not receive a go-ahead from NASA.

A lover of wild landscapes, DellaGiustina graduated in 2008 and moved to Fairbanks, Alaska, to study glaciology. Lauretta wasn't sure he'd hear from his precocious mentee again. Students come and go every year; most of the time, they don't return.

Mission team members Zoe Zeszut and Jerry Chang
Photo: Chris Richards

Dante Lauretta and Dani DellaGiustina have led the effort to return an asteroid sample to Earth, a first-time feat for the United States. | Photo: Chris Richards

'Email me,' Lauretta said. DellaGiustina did.

Lauretta's first mentor, Ray Jordan, trained show horses in New River, Arizona — a not-quite-town, he says, off Carefree Highway between Phoenix and Flagstaff. Lauretta grew up there, sometimes biking into larger Cave Creek with a buddy to snag a candy bar and soda at the closest Circle K. The junket, he says, took up whole Saturdays.

He began as a ranch hand at the age of 11, cleaning the stables. Later, he witnessed the birth of a colt, named Raja. Jordan entrusted him with the horse's care. He trimmed his hooves, lunged him in circles. Through age 15, Lauretta worked for Jordan. "He really helped me out a lot," he says. "And he gave me a lot of positions of responsibility."

A "cosmic wanderer," Lauretta came to the university on an undergraduate scholarship in 1988, and his dreams in science found definition. He worked with Carl DeVito, a professor in the math department, on a project about talking to aliens. He got a student job with NASA. He stared at the stars, took long hikes and drove around in a camper van, sometimes sleeping in it.

When he encountered the LPL, he knew what he wanted to do. Back then, the lab was sending rovers to Mars and Saturn.

In 2012, DellaGiustina returned to UArizona. She worked for a year and change as a research scientist in the physics department. She had kept in touch with Lauretta, and over lunch one day she told him she was looking for something new. He hired her to join the OSIRIS-REx team as an image-processing scientist.

Today, the two have worked on the mission together for almost a decade. Lauretta is the principal investigator. A Regents Professor, he has overseen OSIRIS-REx since its 2011 inception. DellaGiustina is the mission's deputy PI, his second-in-command. After earning her doctorate from the university in 2021, she also is an assistant professor in the LPL.

She never stopped working on OSIRIS-REx while earning her degree — in a discipline, geophysics and seismology, entirely unrelated to the mission. DellaGiustina possesses, Lauretta says, "an amazing capacity for intellectual effort." Last year, she

> *'When you reach a position of privilege like I have here, you've got to really lift up those who are coming after you.'*

was named to Popular Science magazine's "Brilliant 10" in recognition of her significant early achievement in STEM.

On the job, DellaGiustina says, she and Lauretta have navigated both high-stress and day-to-day situations. They trust one another; she jokes that he is "the devil you know." They've had it out; they've laughed. Lauretta says that DellaGiustina is "just a really fun person to hang out with."

OSIRIS-REx has challenged the duo and their staff of 109 full-time employees and 100-plus students. The asteroid, Bennu, was not as sandy as expected. Instead, it is somewhat rocky, with boulders the size and proximity of buildings on a city block — a truth the mission team did not recognize until its spacecraft had ventured well beyond Earth. OSIRIS-REx is about as big as a RAV-4. The scientists sought to touch it down in a circle the size of a couple of parking spaces. But the sample collection, while messy — the spacecraft kicked up dust when landing — was successful.

Next, after the long-awaited drop-off in an Air Force test range of the Utah desert, will come a quieter period of study. This, of course, is the point of the mission. DellaGiustina and Lauretta say that asteroids tell us about a generalized ancestry: how our planet came to harbor life.

Carbon-bearing asteroids like Bennu, dark as coal, "likely contributed the dominant amount of water to the early Earth," DellaGiustina says.

After releasing its precious payload, OSIRIS-REx won't land on Earth; instead, it will venture back into the cosmos, where it has flown since 2016. And DellaGiustina won't rest, either: Once the Bennu sample reaches Earth, a NASA extended mission, OSIRIS-APEX, will begin.

DellaGiustina will be the principal investigator. She's taking over from Lauretta, who will be a science co-investigator on APEX — a grandfatherly type, he says, around to offer institutional knowledge and "for all the fun stuff," but not when he's not needed.

* * *

On OSIRIS-APEX, early career development opportunities will abound. That's how NASA extended missions work, and DellaGiustina couldn't be happier. Half of the team for APEX qualifies as "early career," and this is not accidental. NASA missions don't happen often; chances to move up can be hard to come by. DellaGiustina's goal is for the early career scientists on APEX to partner with leads from OSIRIS-REx, eventually assuming their roles.

As for the science, the APEX team will observe a new asteroid, Apophis. This time, the OSIRIS spacecraft will trail its mark through space without ever touching down.

Apophis, a stony asteroid, is brighter in color and smaller than Bennu. Still, like Bennu, Apophis may tell us about life's origins on Earth. There are signatures in Earth's water, DellaGiustina notes, not explained by objects like Bennu. Perhaps stony asteroids hold a key.

"A stony asteroid is composed of a lot of silicate materials, which have oxygen atoms," DellaGiustina says. In orbit, she continues, they are pelted by the solar wind, which contains hydrogen — allowing for water to form, if only a little.

* * *

Lauretta, who has previously designed board games as a creative outlet, is now writing. He's almost done with a memoir. And in July, his book with Brian May — the lead guitarist of the rock band Queen, who holds a doctorate in astrophysics — came out through May's London Stereoscopic Company in joint production with the University of Arizona Press.

"Bennu 3-D" tells the story of the OSIRIS-REx mission. To get the most from its many photographs, the book comes with a stereoscope, which makes a 2D image appear 3D, an area of specialty for May. "It's 212 pages of asteroid — nonstop asteroid," Lauretta says.

Lauretta hasn't forgotten the day he received a phone call from Drake, his own mentor, asking him to join the mission that started as OSIRIS, later evolving into OSIRIS-REx. He'd never taken a call like that, but the conversation heralded a beginning.

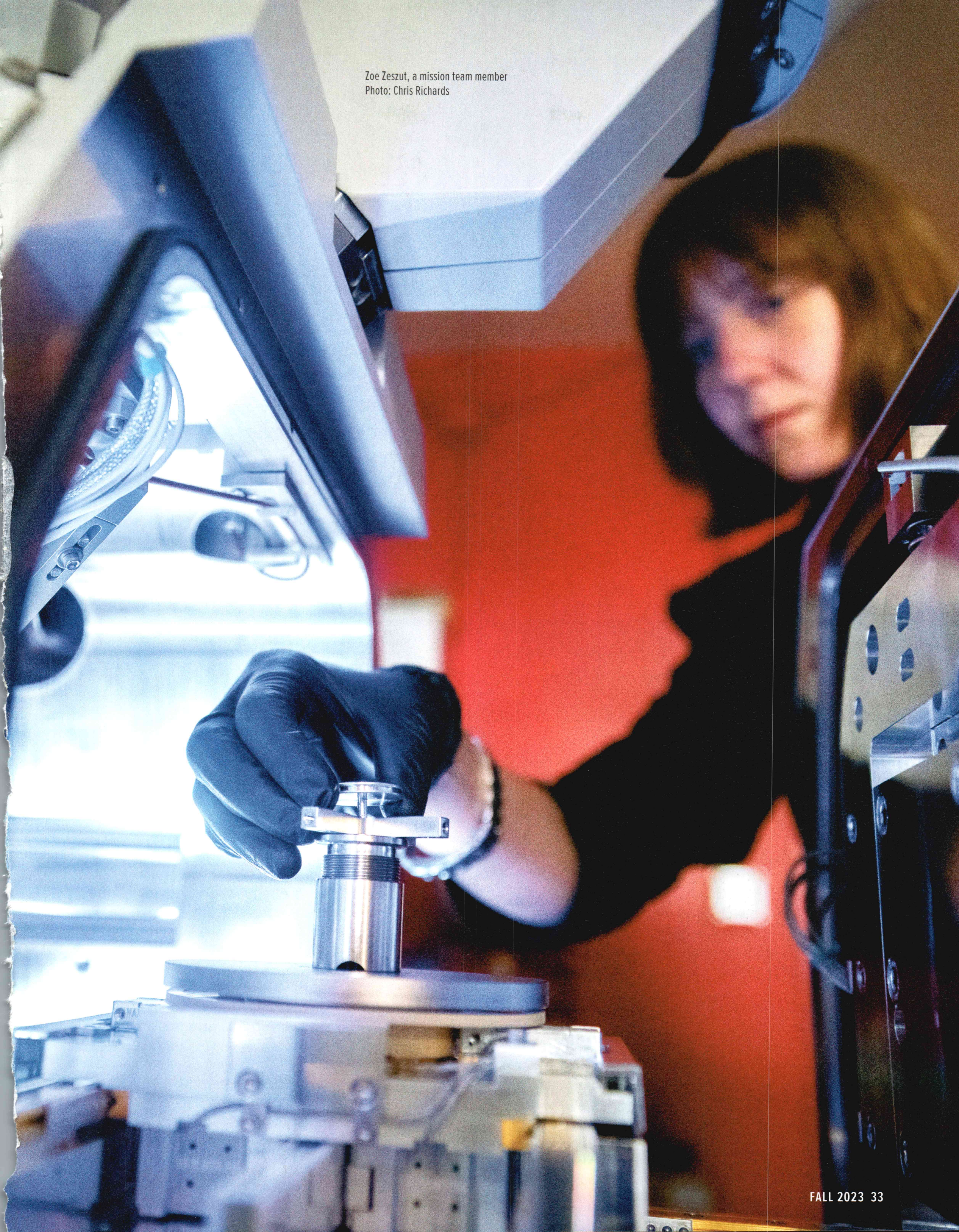
"He was the one who really taught me how to be a leader, how to be a role model, and the importance of thinking about the next generation," Lauretta says. "And he knew Dani. He was really fond of her.

"When you reach a position of privilege like I have here, you've got to really lift up those who are coming after you."

DellaGiustina, Lauretta says, has embraced that responsibility, just as she's done with every other.

"Getting to watch your students grow and then really step into the role of your equal is just so satisfying," says DellaGiustina. She mentions Namrah Habib '18, a mentee of her own who, today, is a doctoral candidate at Oxford University.

"There's kind of nothing like it," she says. "And it's great to see the capacity for them to move beyond you."



Zoe Zeszut, a mission team member
Photo: Chris Richards

Sheri Wells-Jensen and Bailey Burns, two of the four Inclusion 1 team members
Photos: Chris Richards

SHOOTING FOR THE STARS

The Inclusion I crew completes the first mission in a pressurized habitat at Biosphere 2.

By Mikayla Mace Kelley

In April, a four-person crew sealed themselves in an air-tight, pressurized habitat on the grounds of the University of Arizona's Biosphere 2, where eight people conducted a similar experiment more than 30 years earlier.

The Space Analog for the Moon and Mars habitat, or SAM, was created to let people experience what it might be like to live on the surface of another celestial body.

Six days after the crew members entered the habitat, a crowd gathered to watch them emerge. The crew spilled out with smiles on their faces and applause in their ears, marking the completion of SAM's first mission, Inclusion I.

Kai Staats, director of research for SAM at Biosphere 2, and his team created SAM to serve as an experimental prototype of a fully enclosed system that might one day support humans living and working in space. Preparation for living in space requires testing the feasibility of mechanical and plant-based life support, learning to maintain food crops in a sealed greenhouse, studying the microbiome of a sealed environment, practicing using tools during extra-vehicular activity in a full pressure suit, developing a high-fidelity computer model to help design future habitats and much more.

"SAM is an analog, which is a place to practice before you do the real thing," Staats says. "You can think of a pool as an analog — a place where you practice swimming safely before entering the ocean. In that respect, this building is an analog for how we might live on the moon and Mars. We're practicing our techniques, procedures, technologies and even our interpersonal interactions before we eventually carry ourselves to another planetary body."

The 1,200-square-foot SAM habitat combines the Test Module greenhouse, a Biosphere 2 prototype built in 1987, with a workshop, kitchen, common area and sleeping quarters. The Test Module greenhouse includes a hydroponic system to grow food with controlled lighting, humidity, heating and cooling. The workshop provides tools and a place to repair or build equipment for research and mission projects.

About a dozen analog space habitats exist globally, Staats says, but no others are sealed and pressurized like SAM.

The first mission

Anyone can apply to use SAM to conduct research projects. Inclusion I was the habitat's first mission.

The crew consisted of Inclusion I mission commander Cassandra Klos, a fine art photographer and curator who visually documented the mission; mission medical officer Eiman Jahangir, a cardiologist, scuba diver, space enthusiast and two-time NASA astronaut candidate finalist; mission engineer Bailey Burns, a Blue Origin aerospace systems engineer focused on environmental control and life support systems; and mission communications and accessibility officer Sheri Wells-Jensen, a linguist who teaches at Bowling Green State University in Ohio.

Burns focused on monitoring lung pressure, oxygen and carbon dioxide levels in the habitat. Wells-Jensen helped the team consider the accessibility of the habitat. Jahangir ensured that the team stayed healthy and tested stress mitigation strategies.

From outside, Staats' team constantly monitored the pressure, carbon dioxide, oxygen, relative humidity and temperature of the habitat. "The team had to learn how to manage the airflow to control carbon dioxide levels. Even their exercise, cooking and sleep patterns affected carbon dioxide levels," he says. "But at no point were they close to harmful levels."

While sealed inside, the crew members' only means of communication with the outside world was delayed email, to simulate being far from Earth. They got creative with vegetarian freeze-dried and rehydrated ingredients to prepare meals that resembled those that would be available to lunar or Martian astronauts. They also dehydrated and stored their food scraps so future crews could feed them to mycelium — root structures that produce protein-packed mushrooms.

In addition, Wells-Jensen, who is blind, took a simulated space walk through the habitat's prototype moon-Mars yard — a space filled with very fine basalt and rocks to mimic lunar and Martian surfaces. Since you can't hear anything outside while wearing a pressure suit, she relied on her team to guide her through the yard by radio.

"What makes this extraordinary is that this is quite likely the first time a blind person has maneuvered across simulated Martian terrain in a pressurized space suit while breathing air through an umbilical cord drawn from a pressurized habitat," Staats says.

Wells-Jensen also added Braille to many of the surfaces inside SAM to guide future crew members who might also be blind.

"My objective was to look at the systems and policies in terms of what would make this a welcoming space for any astronaut, regardless of their background or how their body is configured," she said after exiting SAM. "One-quarter of the Earth has some significant disability, and we can't leave them behind. We need everybody with us."

Lessons for space and for Earth

Managing resources in SAM offers lessons not only for how to successfully live on the moon and other planets but also for how to live more sustainably on Earth, say those involved in the project.

For example, Inclusion I was allotted 60 gallons of water for four people over six days.

"They had to be careful with consumption, recycle as much as they could and engage in daily quality-of-water analysis as they experimented with filtration," Staats says.

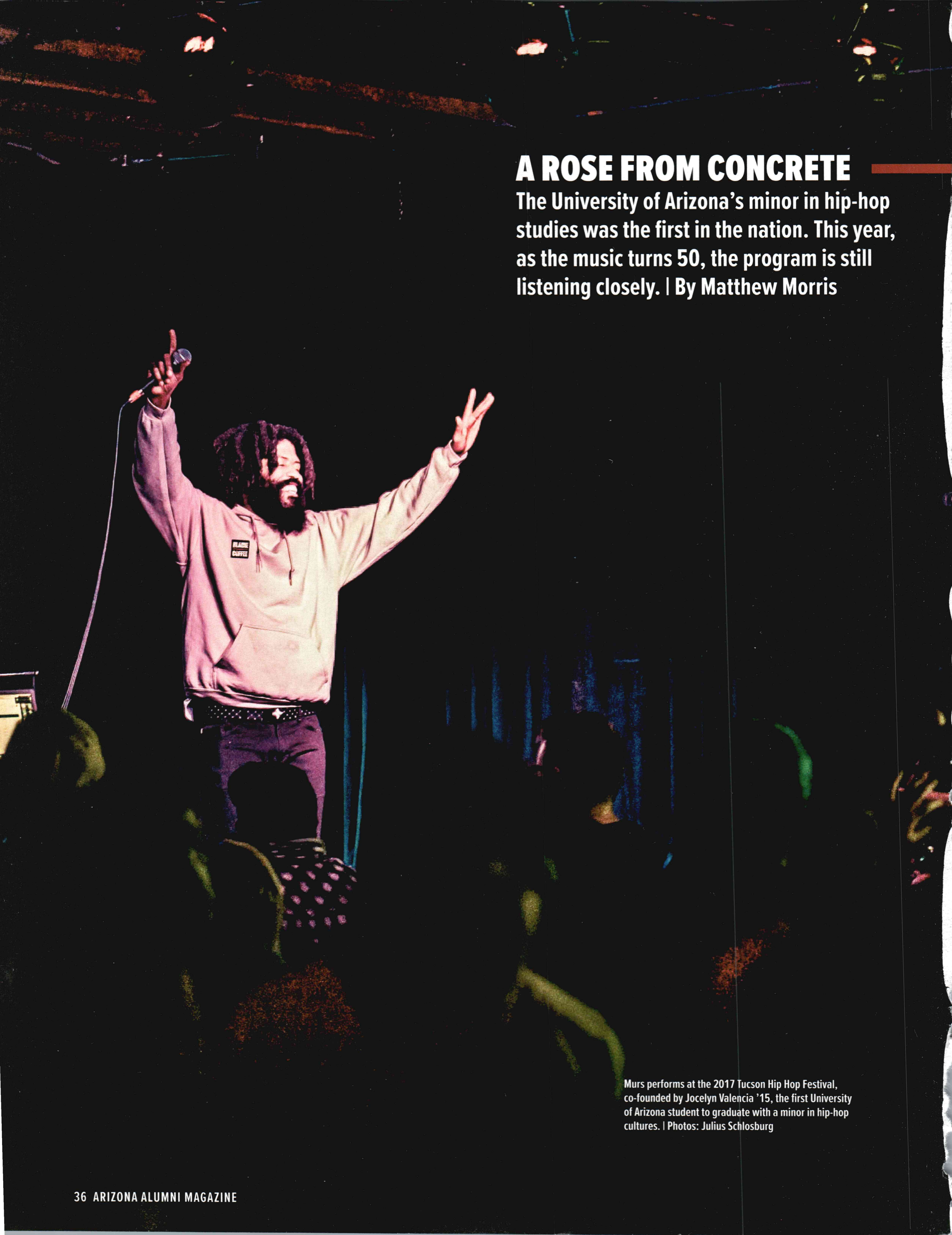
By the mission's end, the crew had used only 40 gallons of water.

"Many of us take 40-gallon showers, let alone live with three companions for six days with that much water," Staats says.

How we will someday live on the moon or Mars is how we should be living on Earth today, the mission participants say.

"Living within your means and living sustainability is not suffering," Wells-Jensen says. "It doesn't hurt you to be a good steward of the resources we were given."

Staats and his team completed the second SAM crew and mission, Inclusion II, May 10-15. As SAM continues to grow, so will mission lengths: Eventually, missions will be months long.



A ROSE FROM CONCRETE

The University of Arizona's minor in hip-hop studies was the first in the nation. This year, as the music turns 50, the program is still listening closely. | By Matthew Morris

Murs performs at the 2017 Tucson Hip Hop Festival, co-founded by Jocelyn Valencia '15, the first University of Arizona student to graduate with a minor in hip-hop cultures. | Photos: Julius Schlosburg

"You try to plant something in the concrete — you know what I mean?" begins the late Tupac Shakur on his spoken-word masterpiece "The Rose That Grew from Concrete," his voice strong and sure over the plaintive notes of a plucked guitar and backup vocals straight out of a Sunday gospel choir.

"If it grow," the rapper continues, "and the rose petal got all kind of scratches and marks, you're not going to say, 'Damn, look at all the scratches and marks on the rose that grew from the concrete.' You're going to be like, 'Damn, a rose grew from the concrete?'"

Birds twitter and chirp in the background, almost inaudible, then louder.

"Same thing with me. You know what I mean?" intones Shakur, a funky baseline kicking in. "I grew out of all this."

The musician contended with homelessness and his mother's drug addiction as a teenager in Baltimore and Marin City, California, and his work grabbed hold of Alex Nava '93 from an early age. Today, the University of Arizona religious studies professor still admires Shakur's artistry — and he shares his interest in hip-hop with his students.

Since 2002, Nava has taught the course Rap, Culture and God, examining the intersections between hip-hop and faith. The class regularly draws more than 300 Wildcats, some of whom are "hip-hop heads" and some of whom don't know the music at all.

For Jocelyn Valencia '15, the first graduate of the university's minor in hip-hop cultures, the course "opened a whole new path."

A decade after Nava began offering his class, the university became the first in the country with a hip-hop studies minor, a lone rose in a scholarly field now blooming. The program, housed within the department of Africana studies, turns 11 this fall, just after hip-hop as a genre celebrates its 50th birthday.

The music traces its origins to 1973 in the Bronx, where predominantly Black and brown residents relied on the sound to protest redlining, or residential segregation. At the time, says Africana studies department head Praise Zenenga, hip-hop became an expression of the identity of African Americans, Puerto Ricans and others on the margins of society.

Two thousand miles west and a generation later, Zenenga and Nava stand alongside Alain-Philippe Durand, John Melillo and Tani Sanchez '77 '97 '06 as the minor's founding faculty members.

The program serves students like Valencia, who co-founded the Tucson Hip Hop Festival and now lives in Los Angeles, where she runs a creative agency. Ben Abrams '20, another alum, manages Degen Sports Collective, a digital and physical arts space whose Nashville gallery opening in April was attended by all-pro NFL tight end George Kittle.

Durand, described by his colleagues as the engine behind the program's establishment, says that the minor takes cues from hip-hop based education, an approach to schooling developed by Temple University professor Marc Lamont Hill when he was a high school English teacher working in a difficult neighborhood of Philadelphia. Hill, Durand says, proposed using hip-hop to talk about everything: In the humanities, students could discuss what the practice of rap-battling reveals about the art of argumentation. Sociology courses could consider the music's origins in reaction to the wealth of Manhattan. Computer engineers could study the samplers used by DJs to freestyle on a turntable.

The UArizona program teaches hip-hop as a discipline featuring four archetypal figures: the rapper, the break-dancer, the DJ and the graffiti artist. The music, Valencia says, could not exist without all of them. And if the music did not exist, marginalized groups around the world would have one less source of hope to turn to — because hip-hop, today, is a global phenomenon.

"There's rappers in Russia using hip-hop as a voice of dissent against Putin," says Nava, who also cites MC Millaray, a 16-year-old who advocates through her music for the rights of Chile's Mapuche people.

Born and raised in Tucson, Nava grew up following his break-dancing brother to competitions against neighboring crews. He recalls listening to Grandmaster Flash's socially conscious rap "The Message" alongside the spiritually rich music of Shakur — whose likeness can be found on murals throughout the world, notes Zenenga.

‘The first time I was captivated by the art of language, by words, came through hip-hop.’

Nava is a first-generation college graduate and says that hip-hop performed for him the role books have for others. “The first time I was captivated by the art of language, by words, came through hip-hop, came through the emcees I was listening to — just their rhyme schemes and their ability to work magic with words,” he says.

Sanchez, a professor of practice in Africana studies who specializes in media and film, teaches courses within the minor focusing on hip-hop cinema and Blacks in Hollywood. Politically inflected hip-hop, she says, “is a way for people to become aware of another way of being.” That swung-open door is valuable in a school setting.

“My impression is many students have questions,” Sanchez says. “They’re like, ‘OK, I’m here at this university. How can I learn about my world?’ And this is one way to learn more about it, to learn about race relations, power relations, to learn how people create, how they have joy, to learn how people challenge and also resist.”

Among the films Sanchez uses in classes is “Straight Outta Compton,” which follows the true-to-life tale of the strivers who overcame gang violence and poverty to form N.W.A., a hit rap group, in the late ’80s. In one scene, a teenaged Andre Young lies on the floor of his bedroom surrounded by vinyl records, eyes shut, moving his hands like a conductor to the soul music sounding through his headphones.

Later on, after Young — better known as Dr. Dre — and his bandmates have made it big, they perform to a maximum-capacity crowd in Detroit. Law enforcement orders them not to play a song protesting police brutality, but they do so anyway, boldly and to the audience’s delight.

During spring break in 2023, Zenenga and Nava led a “study away” to New York City, where the professors — both of whom completed graduate school in the rap hotbed of Chicago — accompanied students on the “hip-hop route” through the city’s boroughs. Each day, a guide greeted the group by calling out, in a salute to the date recognized as the music’s birth, “August 11!” The tour-goers responded in kind, “1973!”

On that pivotal summer day in the Bronx, an 18-year-old DJ, Kool Herc, began toying with his turntables, extending instrumental interludes for dancing guests at his sister’s back-to-school party so that they could freestyle. A friend, Coke La Rock, rapped over the isolated “breaks” — and a genre that Zenenga says is “mostly about improvisation” broke through the cracks. Others in the city were also exploring the sound.

Zenenga, who received his interdisciplinary doctorate in theater and drama, echoes Nava’s ideas about the power of language in hip-hop, saying, “It is verse; it is rhyme; it is poetry; it is spoken word.” He speaks of Halifu Osumare, an emeritus professor at the University of California, Davis, who has argued that hip-hop traces back to the griot, the praise singer and poet in West African societies. “People tell stories about their lives,” he says. “They tell stories about their personalities, their communities, their identities.”

Within the program, Zenenga offers a course on hip-hop dance, while Durand, Dorrance dean of the College of Humanities, teaches U.S. and French hip-hop cultures, a subject he first brought to the classroom in 2003 at the University of Rhode Island. Other active faculty in the minor include Associate Professor Erika Gault, lecturer Johnny Castro and Assistant Professor Jerome Dotson. Melillo continues to teach courses on sound studies within the English department.

Nava has thought, written and taught extensively on the relationship between hip-hop and faith within disenfranchised communities. His most recent book, “Street Scriptures: Between God and Hip-Hop,” looks closely at the work of Kendrick Lamar, whose religious concerns, in arising from experiences of oppression and feelings of despair, align with those of Shakur, Lauryn Hill and the Wu-Tang Clan, he says. He calls Lamar a gift to his course.

“I think Kendrick Lamar has a very rich and profound view of religion and spirituality,” Nava says. “It’s not at all simplistic. It’s not at all dogmatic. It’s not at all preachy. It’s a sincere search for God, and I think it’s an important part of who he is as a rapper.”

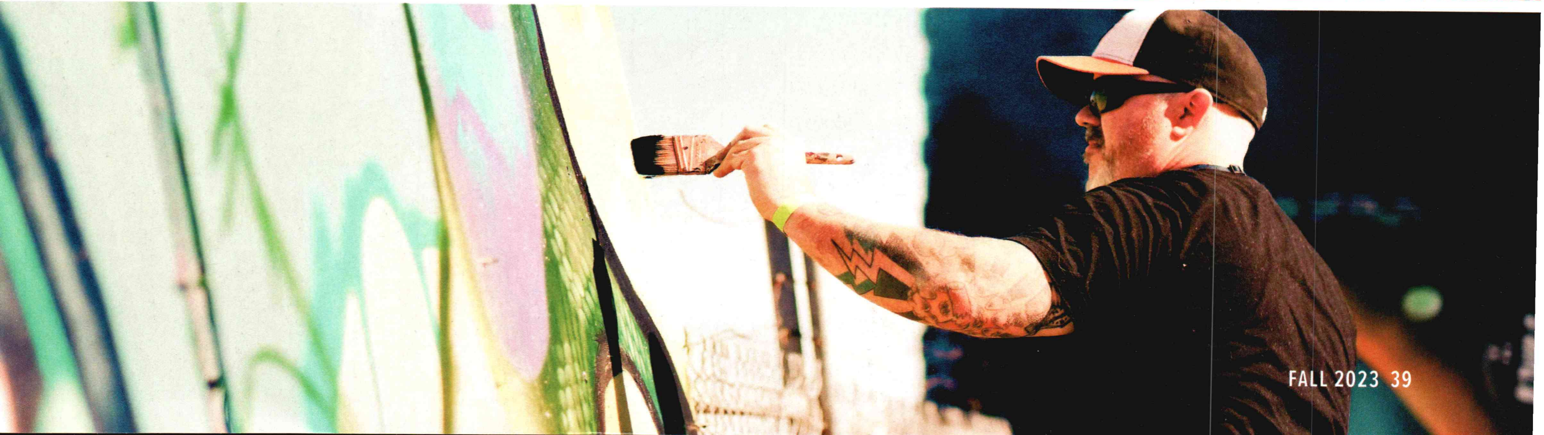
Alumna Valencia co-founded the Tucson Hip Hop Festival with Pike Romero, a local DJ, in 2015. The festival, held most recently in 2022, has showcased artists in each of hip-hop’s four elements while incorporating conference-style presentations. Valencia says that she is most proud of the festival for “gifting hundreds of artists the opportunity to share what they’re passionate about.” Many of the performers accepted to date, she says, had never displayed their talents on a festival stage.

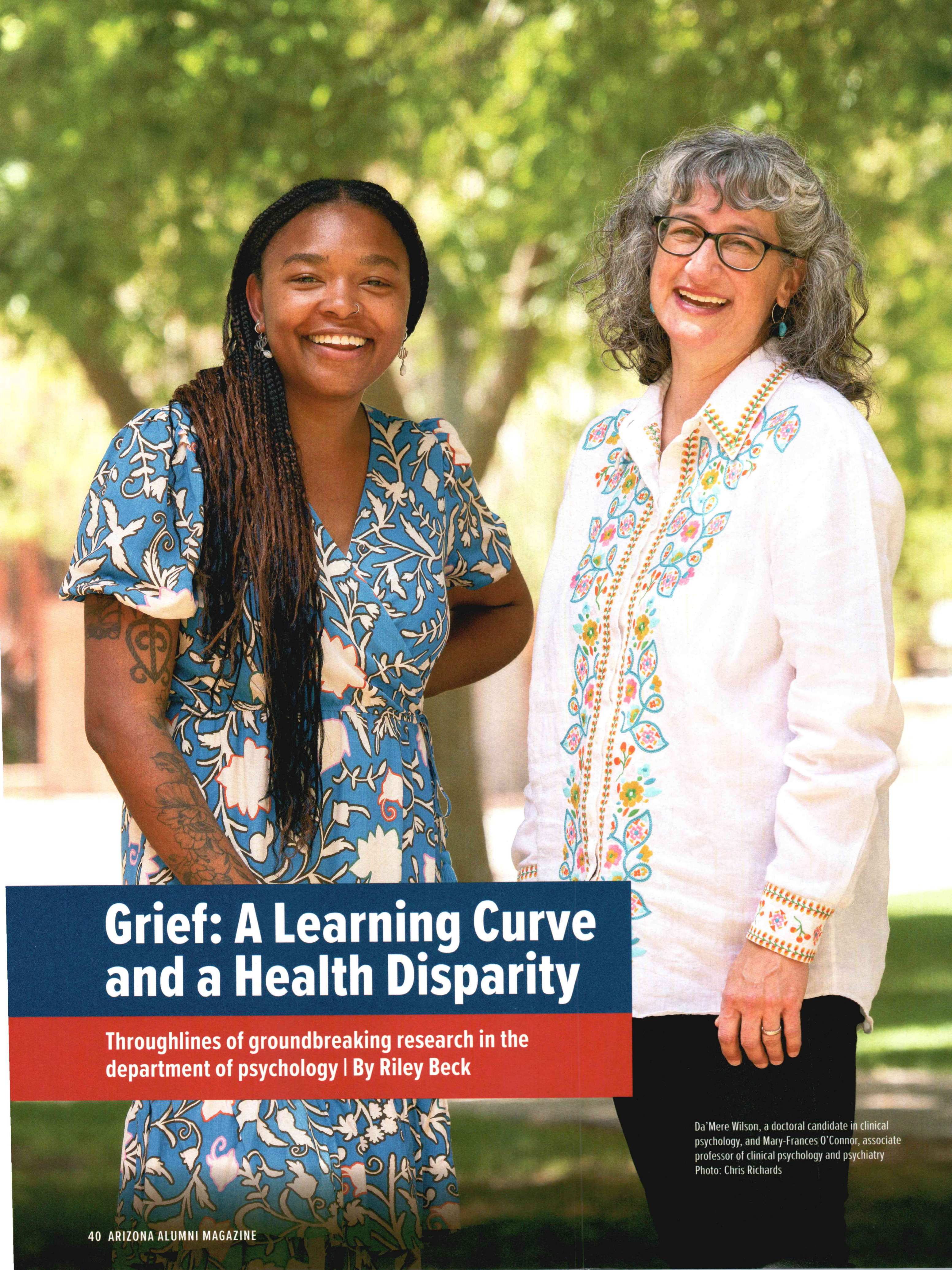
Durand is thankful to see alums like Valencia making their way outside the university. He says that their successes show the value of the minor — and of the humanities in general. Mostly, he is glad when former students like Valencia, Abrams and Eli Piccarreta ’16, who today represents the hip-hop star YoungBoy Never Broke Again, reach out to see how they can help or just to say hello.

“That means that they had a good experience,” he says. “That means that they feel like what they have learned here is serving them well.”

NATIVE INSTRUMENTS

KORG





Grief: A Learning Curve and a Health Disparity

Throughlines of groundbreaking research in the department of psychology | By Riley Beck

Da'Mere Wilson, a doctoral candidate in clinical psychology, and Mary-Frances O'Connor, associate professor of clinical psychology and psychiatry
Photo: Chris Richards

Research at the University of Arizona is multifaceted, with talented faculty both breaking scientific ground and paving the way for the next generation of researchers to pursue their own research interests. To trace one of these throughlines, we sat down with two luminaries in the department of psychology who are shedding light on an experience that impacts everyone, though not always in the same ways: grief.

Mary-Frances O'Connor is an associate professor of clinical psychology and psychiatry at the university. Her research centers on how emotion and physiology correlate with bereavement-related experiences such as yearning and isolation. She believes that clinical science can support the development of interventions for prolonged grief disorder, which is a newly recognized psychological phenomenon. O'Connor's book, "The Grieving Brain: The Surprising Science of How We Learn from Love and Loss," offers a new paradigm for understanding loss through the lenses of how we love and how we learn.

While O'Connor's book is not meant to offer advice, it helps readers navigate their own grief or the process of supporting another person who is grieving. In it, O'Connor frames grieving as learning to live a meaningful life without a loved one, and she reminds readers that the brain is excellent at solving problems and learning. She explains one especially difficult aspect of grief, which involves our brains' preferences for habits and predictions, many of which are directly at odds with accepting the death of a loved one. But that's not the end of the story. O'Connor takes readers through the neuroscience of how our brains grapple with reconciling the assumptions we need to survive life with the new reality we need to accept in the wake of bereavement.

Da'Mere Wilson is a psychotherapist and doctoral candidate in clinical psychology who is advised by and has worked with O'Connor on grief-related research. Wilson specializes in racial trauma and grief, including intergenerational trauma within the Black community. Wilson's work questions the concept of grief as an experience of individual loss and personal pain, as it is often framed in psychological literature. She explores possibilities for the expansion of our definition of grief as well as whether the experience of grief — not just its certain visitation in our lives — is universal. She also addresses the roles racism, racialization, collective history and racial identity have to play in understanding the answer to these questions.

Wilson's research interests were inspired in part by her observations of layered losses within her own family and community and the fact that these layers are not discussed in current psychological literature. Wilson's work, including her article "From Grief to Grievance: Combined Axes of Personal and Collective Grief Among Black Americans," explores how the racialization of Black people in the United States has resulted in a unique experience of loss, grief and bereavement, including forms of collective grief that have not yet been researched. She also addresses grief as a health disparity that disproportionately impacts Black people.

Part I: Q&A with Mary-Frances O'Connor

Q: Could you talk a little about the history of grief research?

A: It's pretty spotty! I think most people think about Elisabeth Kübler-Ross' five stages of grieving when they think about grief. While those stages are a good description of what grief can feel like, they can be used as a prescription for how to grieve, as though we go through them in a linear way and then we're done grieving. More contemporary research recognizes that, over time, there's increased acceptance of the painful reality that a person is gone, and there is less yearning for them, but that isn't a linear process.

Q: How has your research intervened on previous understandings of grief?

A: In 2003, I published the first fMRI [functional magnetic resonance imagining] study on grief. We asked people to bring a photograph of the person who had died into our lab and then showed it to them while they were lying in the scanner. And we were able to see the brain activation that was a reaction to that photograph as compared to when they were looking at just a person they didn't know. Not surprisingly, we found that grief involves complex brain activation.

But I think it was really the next study that changed our landscape of understanding grief, because we discovered that yearning — the experience of wanting our loved one so much — was correlated with nucleus accumbens activation, which is part of the reward network. It seemed a little odd at first that grieving would be related to the reward network. But if you think about it, this wanting is a part of seeking something that's important to us.

Q: Could you talk a little about the gone-but-everlasting theory and how you frame grieving as a learning curve?

A: Our brains can actually have two streams of information going on at the same time, even though they can't both be true. On the one hand, we have a memory system that tells us that this person has died, but on the other hand, we have attachment neurobiology. And part of that attachment neurobiology is this deep belief: I will always be there for you, and you will always be there for me. And this works really well when both people are alive. It keeps us safe. The trouble is that when someone dies, the attachment neurobiology doesn't go away, so we have to adjust to the new reality.

Q: Could you talk about avoidance and the trap of rumination feeling like it holds solutions to grief?

A: They say time heals. But in reality, it's actually experience that heals. Experience helps us understand what does feel fulfilling given all these terrible things that have happened. And one of the problematic things we can end up doing is engaging in avoidance. There may be a place or feelings you avoid because you'll think about the person who's died and feel pain. However, avoidance doesn't give the brain a chance to adjust to what your life is like now.

Rumination involves thoughts you keep having over and over again that are typically about the person who has died. Being caught up in those thoughts can actually be a form of avoidance. I think about it this way: One flavor of these rumination thoughts is what I call the "would have, could have, should have," which are all those stories we play out in our head. The end of each of those stories is "and then my loved one lived." But the painful reality is that they didn't. There are no answers to those questions, so if we are caught in them, then we're not necessarily in the present moment, which is where we heal.

Q: What would you most like people to take away from your work?

A: The first thing I would want people to take away from my work is just how normal grief is, even though it often feels wrong. The second thing is that, when we love each other, it rearranges the way proteins are folded in our brains and the types of neural firing that happen. Our brains are forever changed because of our love relationships, and I find that to be very heartening.

Part II: Q&A with Da'Mere Wilson

Q: What is the commonly accepted definition of grief and how you would expand it?

A: For many people, the concept of grief refers to acute pain that accompanies the loss of a loved one, and it's considered an individual process. I think we could broaden the definition to include loss in general. It can result from having your child taken away or from seeing your loved one go to jail. When we have such a limited definition, we're missing so many things.

I think one thing we're missing is that there are different processes within racialization that mean grief is not just experienced on a personal level. There's also the grief that that comes from the collective. Whether that's violence in the local community or what you're exposed to on the national landscape, those experiences can contribute to a level of grieving that I don't think is even really thought about or asked about.

Q: What is universalism in psychology and how does it impact findings on grief?

A: Universalism within psychology means that certain experiences are considered consistent across all people and cultures. And it's very common for psychological samples to be predominantly white. An unspoken assumption, then, is that even if you have a predominantly white sample, you can say the experience of that sample is true for everyone, and not simply true for that particular population. That is a racist assumption because it accepts that whiteness is the norm.

Q: Could you talk about the false narratives that can arrive from samples that aren't representative and the "decontextualized comparison" that you have described in your work?

A: Consider "prolonged grief disorder." Studies with predominantly white samples have concluded that Black people are two times more likely to experience this disorder than white people, and the implication is that Black people are at a relative psychological deficit. It could very well be that Black folks are struggling more with grief. But is that the case because they're inherently deficient in some way? Or is that the case because the particular death that was studied was actually the 12th that they'd experienced over their lifespan, and they also have a cousin who's locked up? If so, is that disordered, or is that a population struggling under immense oppression and grief? Also, if we are going to understand Black grief, we at least need to include Black people in meaningful numbers in our samples.

Q: You discuss bereavement as a health disparity. Could you talk about that reality?

A: As of 2020, the average life expectancy for a white American is 78 years, while the average life expectancy for a Black American is 72 years. This gap increased by

> **‘When we love each other, it rearranges the way proteins are folded in our brains and the types of neural firing that happen. Our brains are forever changed because of our love relationships, and I find that to be very heartening.’**
>
> — Mary-Frances O’Connor

more than 2.5 years from 2019, largely due to the unequal distribution of COVID-19 deaths. The COVID-19 pandemic death rate for Black Americans is more than 1.5 times higher than it is for white Americans. Black children were nearly 2.5 times more likely than white children to lose a parent or caregiver during the COVID-19 pandemic. This is on top of the fact that Black Americans are twice as likely to die from heart disease as white Americans and are 50% more likely to have high blood pressure. Black Americans are also more likely to die at early ages from all causes than white Americans, according to the CDC.

Think for a moment about how all of these statistics actually impact surviving loved ones. In addition to psychological consequences, these many losses have medical consequences, such as thickening of heart tissue. Even the widowhood effect, in which a surviving spouse dies soon after their partner dies, is 1.5 times higher among Black Americans. These statistics are often blamed on “social factors,” but when those “social factors” are not linked to racialization and racism, we miss important root causes of sickness and early death among Black individuals.

The idea of bereavement as a health disparity is really speaking to a preventable difference in the burden of disease between different groups. This is not about the genetics of Black people. It’s about the result of 400-plus years of extreme oppression, extraction and dispossession and the consequences of racism in the United States, which means that we’re made to grieve more often and made to live sicker lives.

Q: How are parasocial grief, linked fate and fictive kinship related to grief?

A: A parasocial relationship is generally considered a one-sided relationship where someone has an attachment to someone they see in the media. Linked fate is the idea that what happens to someone who looks like me or shares an identity marker with me could happen to me or to someone I love with that identity overlap. It’s similar to fictive kinship, which is a direct throughline to dealing with chattel slavery specifically in the American context. The idea is that our family ties were so loose, because of the nature of how we were treated like livestock, that people just came together around other people that they didn’t necessarily have a blood relation with, and these bonds were in many ways familial. This is why I think we’re more apt to experience the murders of Trayvon Martin or George Floyd and think about and feel them personally and deeply: It feels like, “I’ve just lost an uncle” or “That could happen to my son.”

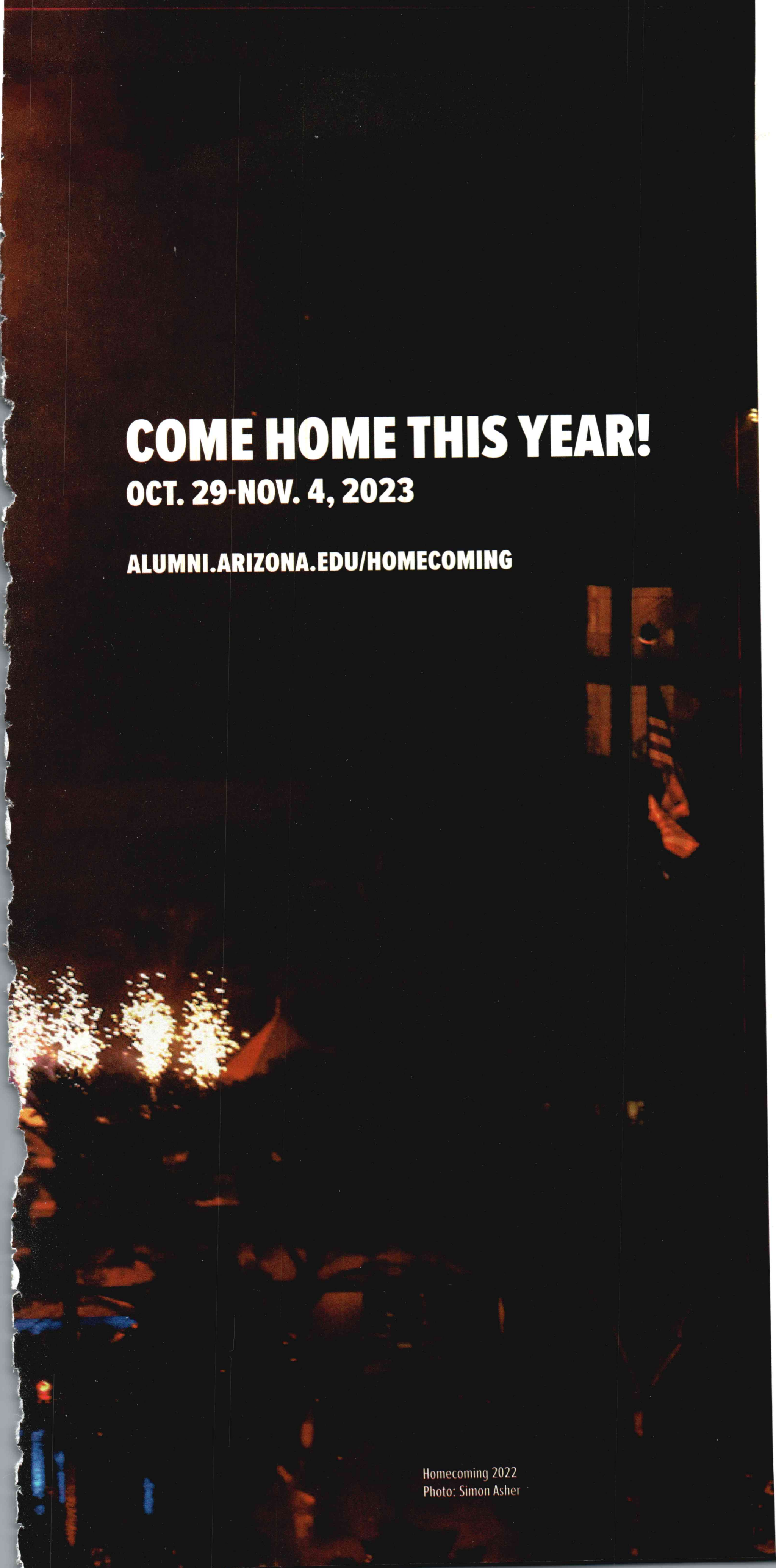
Q: What would you most like people to take away from your work?

A: Grief is expansive. The profound loss of a loved one to death or familial separation, or a of community member to racialized violence, vastly impacts us mentally and physically. It’s my goal to give people, especially those who experience racism, permission to grieve for the many losses we face. I hope to influence the field of psychology to broaden its definition of grief to study these unique experiences and provide tailored therapeutic interventions.

CELEBRATING THE

SPIRIT OF WONDER

IN ALUMNI



Homecoming 2022
Photo: Simon Asher

Today, degree in hand, Tony Moreno '21 is a "swing" in the long-running Broadway show "The Book of Mormon," ready to jump in as any one of seven characters at the snap of his director's fingers. Twins Fernanda '16 '18 and Paulina Bueno '16 '18 are Hollywood marketing professionals who credit networking for part of their success. Kam Kindschi '20, who got into unscripted-television producing after responding to a Craigslist ad near his hometown of Bullhead City, Arizona, works on documentary and reality series for national networks and streaming services, among them HGTV and Netflix.

Meanwhile, Reuben Carranza '90, group CEO of beauty brands Amika, Eva NYC and Ethique, advocates for Arizona Arts student initiatives alongside his husband, Jim Hoffbauer. Like Chris LaNeve '89, a major general in the U.S. Army, and Ricky Hunley '87, who coaches Arizona football's defensive line and once suited up for the Wildcats himself, the couple has embraced a cause larger than their own lives.

Their stories, which we highlight here, reveal the many paths that University of Arizona graduates follow in their careers. And their voices underscore two truths: Wildcats make an impact everywhere, and Wildcats don't go it alone.

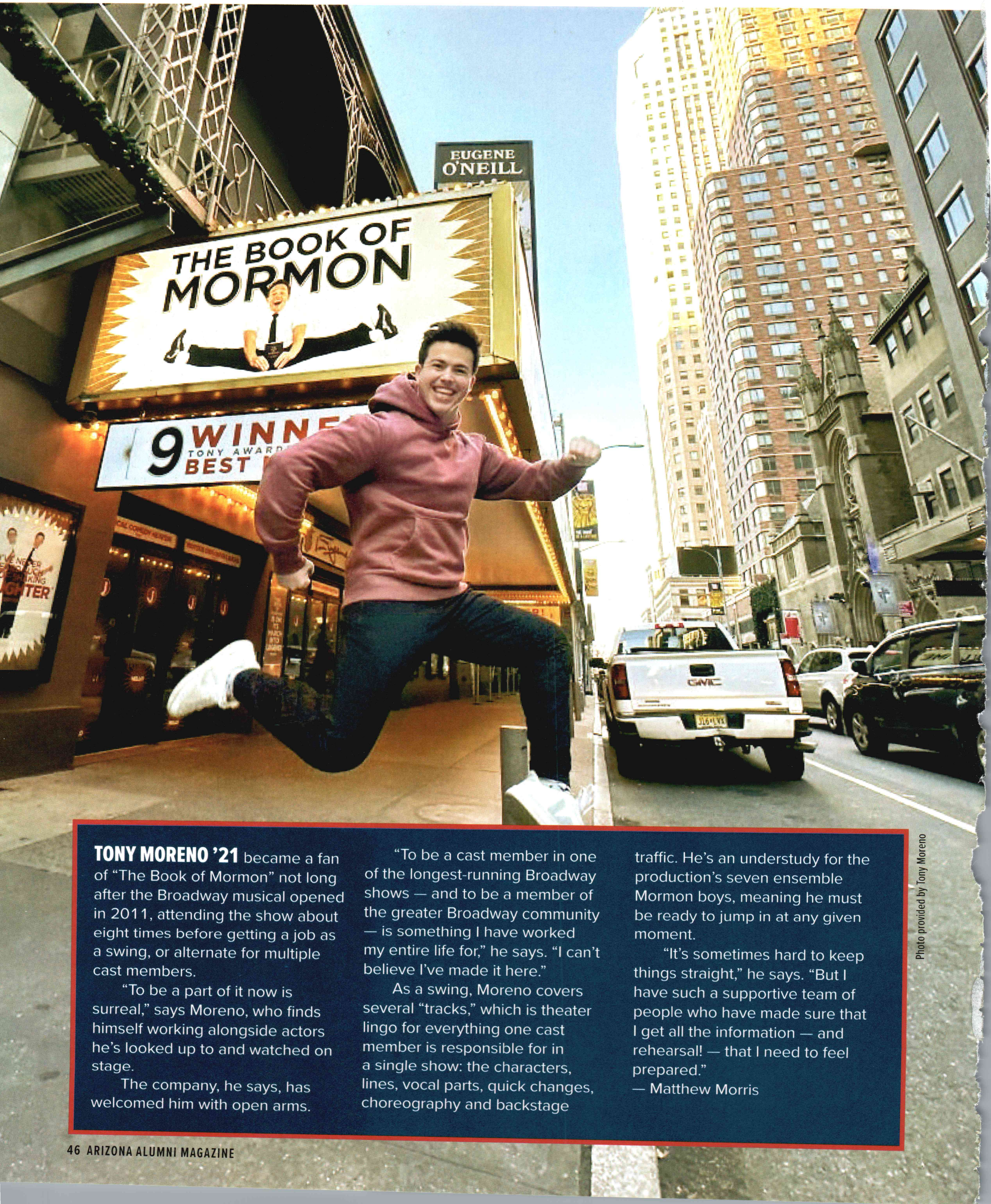


Photo provided by Tony Moreno

TONY MORENO '21 became a fan of "The Book of Mormon" not long after the Broadway musical opened in 2011, attending the show about eight times before getting a job as a swing, or alternate for multiple cast members.

"To be a part of it now is surreal," says Moreno, who finds himself working alongside actors he's looked up to and watched on stage.

The company, he says, has welcomed him with open arms.

"To be a cast member in one of the longest-running Broadway shows — and to be a member of the greater Broadway community — is something I have worked my entire life for," he says. "I can't believe I've made it here."

As a swing, Moreno covers several "tracks," which is theater lingo for everything one cast member is responsible for in a single show: the characters, lines, vocal parts, quick changes, choreography and backstage traffic. He's an understudy for the production's seven ensemble Mormon boys, meaning he must be ready to jump in at any given moment.

"It's sometimes hard to keep things straight," he says. "But I have such a supportive team of people who have made sure that I get all the information — and rehearsal! — that I need to feel prepared."

— Matthew Morris

Photo provided by U.S. Army 82nd Airborne Division

MAJ. GEN. CHRIS LANEVE '89 didn't think about becoming a general in his ROTC days. And if someone had suggested it? "I would have said, 'You gotta be kidding.'"

Today, his portrait hangs in the Army section of the University of Arizona's South Hall alongside images of other alumni who are distinguished Army generals.

LaNeve has fond memories of his time on campus — including meeting his wife.

"One day, I met Kim in the Spring Fling office in the Student Union. She was a year ahead of me, working with the business side of Spring Fling," he says. "I said something to her that I thought was smart. She says it was not very smart. We disagree on who finally asked whom out; I say she asked me."

LaNeve, who commands 19,000 paratroopers in the 82nd Airborne Division at Fort Liberty in North Carolina, served multiple combat tours in Afghanistan and Iraq. He took command of the division in Poland during the Russia-Ukraine war in 2022, guiding 5,000 paratroopers.

LaNeve earned three Bronze Star medals for meritorious service during multiple deployments to Afghanistan and Iraq. His military awards also include the Distinguished Service Medal, the Legion of Merit with the Silver Oak Leaf Cluster and the Master Parachutist Badge, Air Assault Badge and Ranger Tab.

He still dons his parachute for an occasional parachute jump with the other paratroopers he commands. It's part of his formula for military leadership, he says: "Never ask your troops to do what you wouldn't do."

"Guns and leaders should get up front," LaNeve says. "Lead from the front. It's not just being there — it's knowing your people and letting them know you care about them. Then, everything else is pretty easy."

— Ford Burkhart

Jim Hoffbauer and Reuben Carranza | Photo provided by Reuben Carranza

REUBEN CARRANZA '90, a native Tucsonan, grew up watching his dad play guitar and listening to mariachi music. He taught himself to play and later joined a mariachi group.

"I learned the guitar and violin by ear but learned to read music in band playing the trumpet," he says. "It taught me how to carry myself in front of an audience, how to speak publicly, how to read a room and hold attention."

At the University of Arizona, he became student body president, and he went on to a successful career in the beauty business, including 23 years at Procter & Gamble. He is now group CEO for Amika, Eva NYC and Ethique.

Carranza and his husband, Jim Hoffbauer, who grew up appreciating opera and the visual arts, share a love of the arts. They are also first-generation college graduates who believe in supporting both the arts and underrepresented students.

"We believe that art and music are universal languages — an education isn't complete without access to the arts. It opens minds," Carranza says.

That's why they made a gift to the Dean's Fund for Excellence in the College of Fine Arts to support students through both the Just*Arts* Fellowships, an Arizona Arts equity initiative, and the Medici Scholars program. "Equity enables access and learning," Carranza says. "These are guiding principles for us, so we love it."
— Charlie Snyder

RICKY HUNLEY '87 brings Wildcat spirit, Super Bowl experience and wisdom to the Wildcats.

"That old Chinese proverb just rings in my ear: 'You cannot taste my tea until you first empty your cup,'" says the former Wildcat linebacker and Super Bowl veteran.

"A lot of kids will come with their minds made up about what they think they know," he says. "But really, they don't know squat. So you kind of break them down. You say, 'Hey, if you're going to be a part of this, you got to do it this way.'"

The way he sees it, a player can't be at home on the football field until he's at home with himself.

Hunley returned to the University of Arizona in 2021 after a successful NFL career. "This is where it all started, and it took me 39 years to get back," he says.

The consensus All-American racked up 560 tackles playing for the Wildcats from 1980-83 under head coach Larry Smith. In 1984, Hunley was drafted seventh overall by the Cincinnati Bengals, and he would go on to play seven seasons with the Denver Broncos, the Arizona Cardinals and the Los Angeles Raiders. He helped take the Broncos to the Super Bowl in 1987 and 1988.

— Tim Vanderpool

Photo: Arizona Athletics

PAULINA '16 '18 AND FERNANDA BUENO '16 '18

have been in lockstep, as twins sometimes are, in pursuing educational and career dreams. They both studied psychology as undergraduates and carved paths toward careers in speech, language and hearing sciences. But something shifted when they dipped their toes into marketing at the Eller College of Management. They fell in love with the field. And today they work for two of the biggest media and entertainment companies in the world.

Fernanda is a product marketing manager at NBC Universal's Peacock, and and Paulina is part of the creative marketing partnerships team at Walt Disney Studios.

They both credit internships and networking for part of their early career success.

"Internships gave us a lot of experience," Paulina says. "We took a trip to LA to visit multiple studios and had chats with alumni who were at notable media and entertainment companies and agencies."

Fernanda says, "It's all about putting yourself out there and networking, especially if you want to break into a business that you haven't tapped into."

Paulina found success after meeting a recruiter during her Academy Gold internship. This networking opportunity helped Paulina jump start her professional career at the Walt Disney Company. — Rhaya Truman

Paulina and Fernanda Bueno | Photo provided by the Bueno twins

Photo provided by Kam Kindschi

KAM KINDSCHI '20 was raised in Bullhead City, Arizona, a small town nestled along the Colorado River. Growing up, he was constantly creating, from making YouTube videos with friends to dabbling in graphic design.

After high school, Kindschi recalls, "I went to community college, and I was living at home with my parents. I was taking classes and was like, 'I have no idea what I want to do.'"

However, everything changed when his father stumbled across a *Craigslist* ad calling for a production assistant.

To his surprise, Kindschi found himself on an overnight shoot of ABC's "The Great Christmas Light Fight." He instantly fell in love with unscripted television, discovering an entire industry dedicated to creating reality shows, game shows and documentary series.

The next morning, he remembers coming home and telling his father, "I've been up all night. I am gonna work in television."

He enrolled in the film and television program at the University of Arizona. Between working multiple jobs and studying, Kindschi took every opportunity he could to freelance.

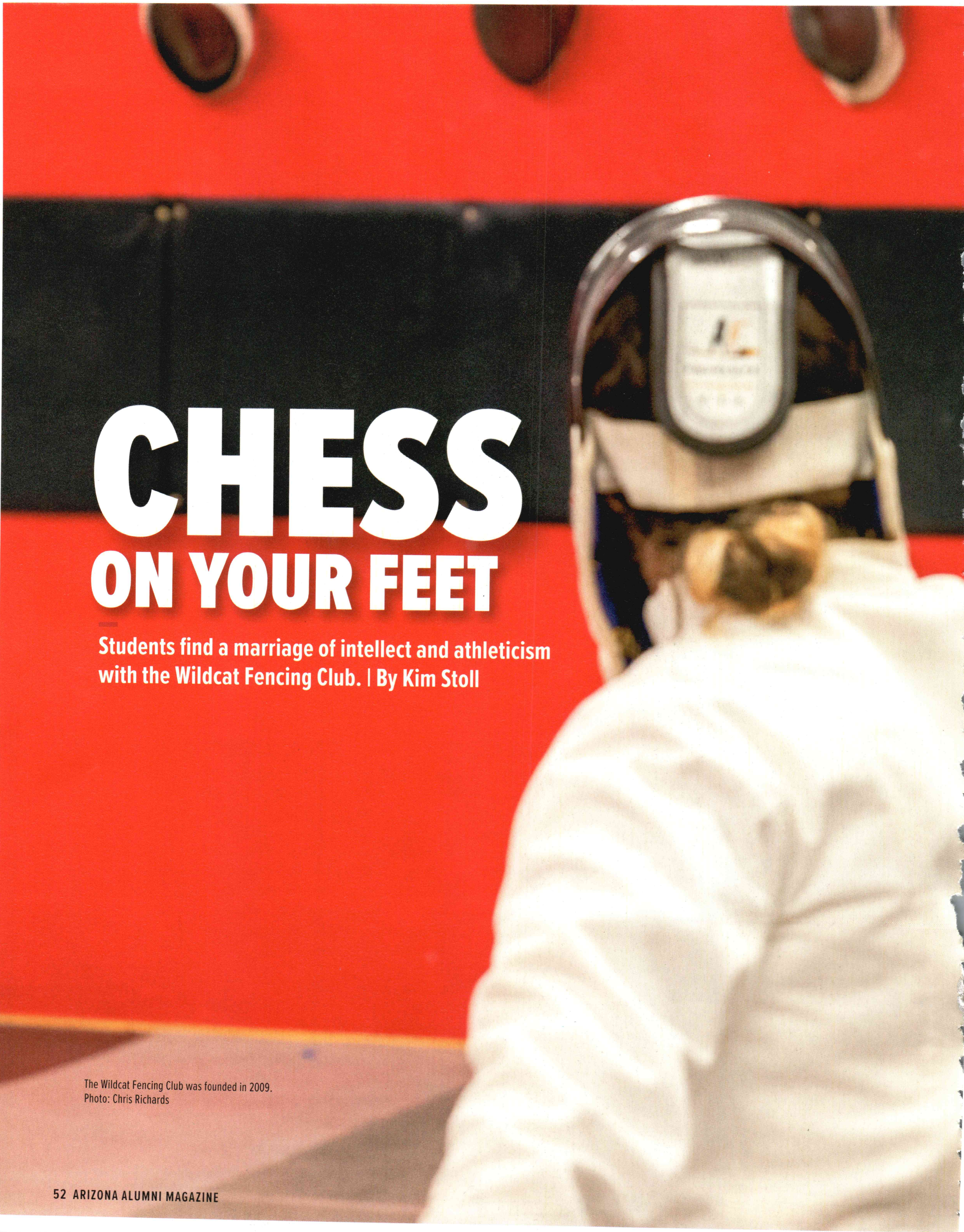
Since his graduation, Kindschi's career has catapulted into success. As a freelance producer, he has worked with prominent networks such as Peacock, Roku and Netflix. He has produced with shows such as Fox's "MasterChef," Netflix's "Get Organized with The Home Edit," and Prime Video's "Making the Cut."

His career has taken him around the world. Recently, he spent over a month in Italy working on an upcoming project, and he is booked until near the end of the year.

While he expressed gratitude for all his experiences, one of the most fulfilling was a six-week gig as a date producer in Hawaii during filming for "Temptation Island."

"I feel like Hawaii was the first show where I got to go to a location I always wanted to and I really felt like I was reaping the benefits of all my hard work."

— Zoe Montano



CHESS
ON YOUR FEET

Students find a marriage of intellect and athleticism with the Wildcat Fencing Club. | By Kim Stoll

The Wildcat Fencing Club was founded in 2009.
Photo: Chris Richards

With masks shielding their faces and bodies suited in white uniforms, rows of fencers ready their blades for attack. Soon the room drones with frequent beeps announcing each touch made and point earned. The dance between opponents lasts less than nine minutes, yet in that time countless calculations are made and responded to with explosive lunges and skillful parries.

This is the scene three days a week at Wildcat Fencing Club practice.

The club operates out of Still Point Fencing, a facility just a few miles off campus that is co-owned by Jay Fowler '13 and Nick Going '12. Now the team's head coach, Fowler founded the fencing club at the University of Arizona in 2009 while he was a student. Starting with only four members, the club grew rapidly and had upward of 60 members before COVID halted club sports. Today, Wildcat Fencing has nearly 20 members and is once again growing.

"Fencing is a great sport, great exercise, and the community here is wonderful; everybody is extremely welcoming," says club president Jack Greger, a bioinformatics and ecology and evolutionary biology major. "That's something I felt when I first joined this club."

The club welcomes fencers at all levels, from top-ranked veterans to complete beginners.

"It helps create a supportive environment, because we get a perspective of all the levels of fencing," Greger says. "It's really cool, because you can learn and grow from each other. Anybody can become a mentor."

Jackson Norbutas, a civil engineering major, has been fencing since he was 10 years old and enjoys taking on the role of mentor to others in the club. "I'm actually training right now to be a coach," he says. "I've been a nationally ranked fencer for about five years, and after college I want to branch out into coaching because I really enjoy helping other people improve."

Greger, who started fencing fairly recently, says he's found there are a lot of lessons to be learned that aren't available in other sports he participated in during high school, such as football and track. Coming to the university, he was looking for something new and put all his effort into fencing.

"The sport requires extreme patience and focus," Greger says. "It can be daunting at first, because the learning curve is steep. You have to have a good perspective and mindset, because you're going to go out there and get destroyed for a few months — and that's just part of the learning process. But once you start getting it, things start clicking and it's really rewarding."

The fencers appreciate the club's supportive community and how it has helped curb the challenges of starting a new sport.

"I felt like people were happy to advise me and walk me through everything," says Anya Moseke, an English major. "It's no secret that fencers tend to be on the nerdier side, and I felt at home with people who have similar interests and inclinations toward subjects as I do."

"I really found my family here," agrees Julia Davis, a natural resources major. "It's amazing just to be encouraged by my friends and see them every single day."

Davis has been fencing for seven years and participated in basketball and track before taking up the sport.

"The reason I stuck with fencing was because it's not a team sport; it's very individual based," she says. "I like it because I focus on myself. You can support your teammates and cheer them on, but there's no real stress on them because you win individually, and as a team we just encourage one another."

Moseke, who also enjoys dance and running, says she comes to fencing practice just as much for the social aspect as for the physical exercise.

"I'm really drawn toward elegant and emotive things, like poetry and modern dance," Moseke says. "And I felt like fencing was one of the few sports that feels very personal and based in problem solving."

She says there is beauty in watching fencers in action, noticing the different styles and aesthetics that emerge through their athletic performances. "It's been nice," she says, "seeing my improvement reflected in the way others fence me, which is something that's more unique to the sport of fencing."

Some fencers rely on explosive attacks and agility, while others take on a defensive and opportunistic approach. In épée fencing, the entire body is the target, from head to toe. Fencers try to sneak in touches on the foot or curve to hit the opponent's side with the tip of the blade. A fencer's physical abilities must also be complemented with mental acuity.

Lindsey Barney, a biochemistry and finance major, likes to watch opponents fence before facing them in a tournament. She observes their habits on the fencing strip — the playing area, also called the piste — and makes notes to adapt her strategy.

"It's really like physical chess," she says. "You can see the gears turning in somebody's mind when they're looking at their opponent and trying to adjust their strategy to be able to get more touches. I'm a very analytical and logical person, and being able to transport that into a physical sport really appealed to me."

Barney wishes that more people knew how accessible fencing can be. "It's portrayed as a very posh, rich-people sport, and it really isn't. It's quite accessible to a lot of people. And I also wish that more people knew that fencing is open to everybody — any fitness level, any body shape. We have all of it at our club."

For Wildcats, taking up fencing is as easy as coming to practice. The club provides all the equipment that students need to get started, and they can take several free classes to ensure it's a good fit before making any sort of financial commitment to the club.

The lessons of fencing extend beyond tournaments, as club members apply the skills learned on the piste to their personal lives.

"When you start fencing, you tend to notice people's body language, because you want to recognize their tells for certain moves," Barney explains. "And that has made me more in tune with how other people are feeling, because I've learned to be able to read the minute changes in people's body language."

Moseke recalls her first tournament and a conversation with another fencer about being new to the sport. "She said something that stuck with me. She said, 'Let's be honest, you have nowhere to go but up. So give it all you've got: Just throw yourself at your opponent if you've been pushed to the end of your strip — you've got nothing to lose.' And that's something I've translated to my daily life."

For Greger, fencing teaches him about gradual victories and focus.

"With both fencing and school, there's not a huge payoff in one day," Greger says. "This sport is very intellectual. Precise focus is required. It's similar to a test-taking environment: You have to steel your focus and be able to perform under pressure."

"It's not like in track, where if you're just a faster runner, you're going to win. With fencing, there's so many variables that you just can't control," Norbutas says. "You have to look at it objectively and be like, 'I may have lost, but I can improve from this.'"

Davis focuses on the process, not the product. "A lot of fencers focus on the end product, and they get discouraged really quickly. If you don't win, it sucks," she says. "Instead, focus on the process, not the end goal."

As she reflects on her growth over the years as a fencer, Davis realizes she's gained a lot of confidence through the sport.

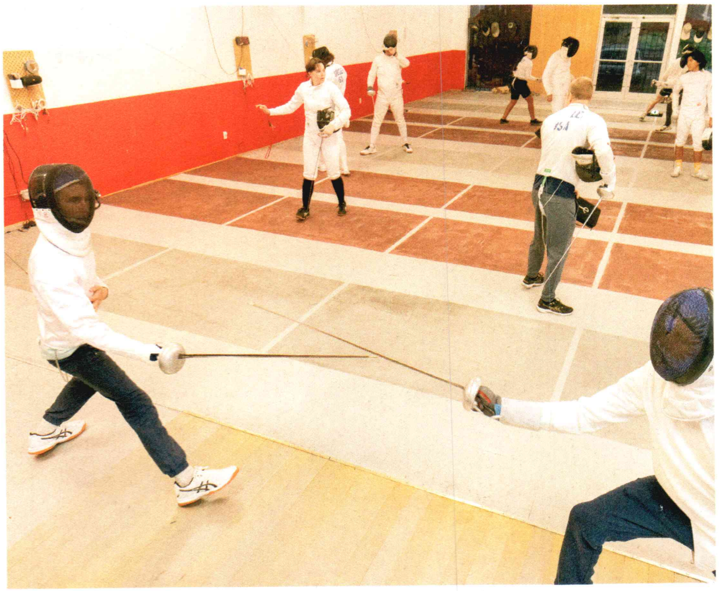
"It's allowed me to be a leader and someone who encourages others," she says. "It's really helped with my self-confidence and not being afraid to try things. Plus, being on the fencing team, I have the opportunity to encourage girls to join this mostly male-dominated sport, which is really important to me."

The atmosphere of a fencing tournament is one of total camaraderie, despite the competitive nature of the sport. Even during intense bouts, fencers can be seen giving knowing smiles to one another when points are scored, as if to say, "That was a good one." As Davis says, "On the strip, you're enemies, and off it you're best friends."

With the eventuality of graduation on their minds, many of the fencers are enthusiastic about continuing to fence after college. Greger says that there are fencing communities outside of collegiate clubs for fencers of all levels.

"I'm not stopping," he says. "I'll be fencing for the rest of my life."

To learn more about the Wildcat Fencing Club, visit uawildcatfencing.com. Any Tucson local can try out the sport through Still Point Fencing: stillpointfencing.com.



Photos: Chris Richards

Jedd Fisch
Photos: Arizona Athletics

THE DESERT TAKEOVER FOOTBALL COLLECTIVE

The convergence of NIL and a conference transition are redefining what it means to 'Bear Down, Arizona.' | By Sarah Beaudry

When Jacob Cowing endures football practice in 100-degree monsoon heat, he's thinking about more than survival. He might long for a water break, certainly, but next on his list is family. And today, family doesn't just mean his 3-year-old son and his sisters and mom.

"When Coach Fisch talked about the importance of recruiting me and my family as a part of the Wildcat family, it was something that was really special to me," says Cowing, a Phoenix native and all-conference senior wideout for the 'Cats.

Add in name, image and likeness (NIL), and Cowing has a fresh perspective on competing.

In July 2021, the NCAA adopted an NIL policy giving college athletes the opportunity to benefit from their prominence. Student-athletes can now develop their personal brands and engage in paid commercial activities with local and national businesses in accordance with NCAA rules and state law.

"Developing my brand wasn't something I really thought about until I came to Arizona," Cowing says. "Before that, I had tunnel vision on taking care of my son and performing at my best on the field. I was working at Door Dash and doing my best to earn a degree."

But when Cowing spoke to children at the Boys and Girls Clubs of Tucson, he realized that being a spokesperson was meaningful. In his first NIL outing, he saw a room full of kids who reminded him why it's important to be a role model.

"It was a special moment for me. I grew up as part of the Boys and Girls Club," he says. "It was great to meet kids who might be going through some of the same challenges I had when I was younger."

The Desert Takeover Football Collective

The speaking engagement was one of many for Cowing, who will continue to build community partnerships through the Desert Takeover Football Collective, a nonprofit that supports business opportunities for University of Arizona football players. The collective, a full-service program, was founded in collaboration with Wildcat supporters and community members, Arizona Athletics, Blueprint Sports, and the football program.

"My wife and I believe in supporting college athletics," says Cole Davis, chairman of the collective. "Being a student-athlete takes discipline, from balancing an academic schedule and practice to travel and competition — making it one of the best ways to develop young people into leaders."

Jacob Cowing

NIL and college football

NIL programs similar to the Desert Takeover Football Collective are available to all student-athletes at UArizona; however, Davis believes in a dedicated program to serve the football team's nearly 110 members.

According to Fisch, NIL has impacted college football in every way — from recruiting and retaining players to providing new opportunities for success. Players, he says, can now use on-field successes to help them off it. "They're able to make money to help their families in ways they never could before. And it's allowed kids to taste a little bit of financial success prior to jumping to the NFL," he says.

A couple years in, NIL policy also has created challenges for college athletics. "We encourage players and families to understand they're still making an educational decision and a football decision when they choose a college — it isn't purely a money decision," Fisch says. "We build this program around creating a sense of family, where academics and personal development matter."

Nonetheless, NIL has created imbalances in recruiting.

In June, UArizona President Robert C. Robbins, Arizona Athletics Director Dave Heeke, Fisch and other

> 'I see the city of Tucson as just one big family. The more student-athletes engage with the community, the more support we can get at games. It's important for fans to meet you and hear your story to build those relationships. It's also really important that we know the stories of those who support us.'

Jacob Cowing

university leaders attended "The Future of College Athletics" summit in Washington, D.C. There, with schools from around the country, Fisch says he was reminded that "the schools that have the most money have the best players."

College football also opened its transfer portal in 2018, allowing players to leave for other teams without sitting out a year.

"With the combination of the transfer portal and NIL, players are leaving for money," Fisch says. "Now, you're looking at a sort of free agency in college football, which never was a factor before."

Other changes in the sport are rocking the competitive landscape, too. Traditionally, NCAA business models boast college football programs as primary revenue generators that support Olympic sports in athletics departments. Ticket sales, sponsorships and television deals keep the lights on. College football is working to develop a new 12-team format for its national playoffs. Mixed with bowl games, it will generate more than $2 billion annually beginning in 2026.

Debate continues around television profits and proceeds for players, and NIL has opened the door to future legislation that may lead to universities paying athletes. Meanwhile, conference realignment has tipped the scales.

Big 12 Conference

Arizona Athletics is preparing to move to the Big 12 Conference and compete beginning in the 2024-25 academic year. The Wildcats will join Arizona State, Utah and Colorado as the conference grows to 16 teams.

The shake-up creates new opportunities for Arizona Athletics.

"Our move to the Big 12 Conference will continue to raise the university's profile by increasing visibility, growing our reach across the country and around the globe, expanding our pool of prospective students, providing more resources to support our student-athletes, and presenting them with greater NIL prospects," Robbins said in a university statement.

Fisch, who says he appreciates the tradition of playing in the Pac-12, finds many positives in the change.

"We all love being in the Pac-12 and playing West Coast schools, but as many of those teams left, it made things more challenging," he says. "Now, it's an opportunity to recruit nationally. It's an opportunity for us to really put a footprint in Texas and Florida. I've recruited in Florida my whole life."

He adds, "The Big 12 has some really good football, and we're excited to be a major contender."

Calling all alumni: Be a part of the collective

From an NIL perpective, Arizona football has room to grow. Some Big 12 programs, such as Texas Tech, TCU, Baylor, Kansas and Oklahoma State, boast successful football collectives of their own. They are reportedly providing players with substantial NIL packages starting at $25,000 thanks to financial support from boosters and alumni.

"As we move into a new conference, new challenges present themselves. Gone are the days when facilities and relationships alone are the formula for obtaining and retaining a strong roster," Davis says. "In this new landscape, we have to make sure student-athletes have the opportunity to capitalize on NIL opportunities.

"The best way to ensure we are successful is a strong collective, and we need alumni and fan support to help make that happen."

There are several ways for alumni to get involved with the collective. For example, businesses can partner with student-athletes for marketing campaigns, digital activations or special events. Football players also earn compensation for supporting charitable causes and have provided more than 3,000 hours of community engagement.

'Bear Down' Tradition

The Arizona football tradition is built on the "Bear Down" motto, with gritty teams like former coach Dick Tomey's, who baffled opponents with his Desert Swarm defense.

However, the program hasn't won a bowl game since 2015. Its last major coup was going 12-1 and beating Nebraska 23-20 in the 1998 Culligan Holiday Bowl. The Wildcats won just six games the next year; Tomey resigned after the 2000 season, and since then, the Wildcats have performed mostly as a "middle of the Pac" team.

Fisch says the program's focus is on getting back to a season like 1998's. And die-hard fans, too, are eager to witness championship-caliber Wildcat football, regardless of conference affiliation.

Just ask Tim Hall '03, who founded the Red Army football fan club as an undergrad. Today, he is athletics director at Tucson Country Day School. He and his Red Army cohort still attend every game.

"There is something special about those big moments, upset wins, crazy come-from-behind victories and historic seasons," he says. "You really have to be in the stadium in order to experience those thrilling moments."

Luckily, fans will still get to rally behind the Wildcats in the Territorial Cup against ASU, experiencing moments like one that Hall describes: "Trung Canidate running wild against that school up north."

> 'In this new landscape, we have to make sure our student-athletes have the opportunity to capitalize on NIL opportunities. The best way to ensure we are successful is a strong collective, and we need alumni and fan support to help make that happen.'

He's on board with NIL, too, saying, "Student-athletes deserve opportunities to earn money from their fame." And Hall and Fisch agree that Tucson has a competitive advantage in the NIL marketplace, because Wildcat sports are the only game in town.

As Cowing prepares for his team's next big game, he's looking forward to being backed by his town.

"I see the city of Tucson as just one big family," Cowing says. "The more student-athletes engage with the community, the more support we can get at games. It's important for fans to meet you and hear your story to build those relationships. It's also really important that we know the stories of those who support us."

SUPPORT WILDCAT FOOTBALL: DESERTTAKEOVER.COM

MAKE A DONATION: Make a tax-deductible donation to Desert Takeover through a partnership with the BPS Foundation, a 501(c)3 organization. Student-athletes will partner with a local nonprofit organization to work on charitable causes.

BECOME A MEMBER: Become a member of Desert Takeover and receive exclusive member benefits, such as meet-and-greets with student-athletes, autographed merchandise and more.

BECOME A CORPORATE SPONSOR: NIL provides opportunities for local and national sponsors to partner with Arizona football student-athletes for endorsement deals, marketing campaigns, appearances and other projects.

Rita Stubbs
Photo: Arizona Athletics

SHOOTING FOR THE STARS

Welcome, alumna Coach Rita Stubbs!

If you're a longtime follower of Arizona volleyball, you know her as Charita Johnson. For newer fans, she's Charita Stubbs — but please call her Rita. The former All-American and assistant coach for 19 seasons was named Dave Rubio's replacement the day after the 31-year head coach announced his retirement in January.

Stubbs, a '94 University of Arizona grad, is still Arizona's all-time solo blocks leader and was part of a program that went from no conference wins to back-to-back Sweet 16 appearances. She spoke with Sarah Kezele '11 about bringing the Wildcats back to the NCAA tournament and preparing for second chances.

You played for Dave Rubio in Tucson and then coached alongside him for 19 seasons. What role has he played in your life?

Dave was like a father to me early on. He allowed me to be myself, which was probably the first time anyone had done that. I come from a hard background and was used to just bullying my way through anything I wanted as a player, and he was just stubborn enough to not allow me to do it to other people. He never gave up on me.

When I first got hired here (as an assistant in '96), you work summer camp and you get a summer check that's separate from your actual paycheck. I wasn't making a lot of money, but I thought I was making a lot of money (laughs). And he said, "Rita, I'm not giving you your camp check until you invest it." I fought him on it, but he said, "No, you've never had this much money at one time. I'm going to show you what to do and how to do it the right way." All these years later, I'm grateful that he did that, because I never would have understood the process. I actually still have the investment to this day.

You endured a difficult tenure as NC State's head coach before returning to Arizona for your second stint as an assistant under Rubio. How did you prepare for this opportunity?

When I was a head coach before, I didn't prepare myself for it. I did it because everyone told me that I should do it. I tried to be Dave, and that's why I failed. I vowed never to do that again. I wanted to be a head coach again, but I didn't want to do it in an environment where I couldn't be true to myself.

In April 2020, right after everything hit hard with the pandemic, I started thinking about it more, reflecting. I started a journal, and I would write down, "If I were the next head coach, this is what I would want. This is how I would do things." I'd take different scenarios in our gym every day and pick Dave's brain. There were a few jobs out there that were of interest to me, but there were so many that were not of interest. It had to be the right fit.

What is your vision for Arizona volleyball on your watch?

I want us to get back to the NCAA tournament. We have the resources and the capabilities to be a team that can compete year in and year out. I want young women to come here and be a part of a program where we're going to care about you from top to bottom. We're going to put our arm around you when necessary, and I'm gonna kick you in your butt when you need that as well — but knowing that it's done out of love and out of wanting you to be your best. And that's how we grow. I don't think we were put on this Earth to do anything by ourselves. I think we need a group of people to kind of help us along. And that's what you'll get from our program.

What are your hopes for this upcoming season?

I'm hoping that we finish in the upper half of the Pac-12. I know that's a daunting task, but we can do it. We have the personnel for it. And the goal is to get to the NCAA tournament. I'm shooting for the stars right off the bat.

ARIZONA NIL SUCCESS STORY: MAYA NNAJI

Maya Nnaji
Photo: Emily Ho

When it comes to her career as a college student, basketball student-athlete and future medical doctor, Arizona standout Maya Nnaji wants to be an agent of change. She wants to impact lives. She wants to be a role model for future generations.

Representation matters in everything she does.

That also includes name, image and likeness.

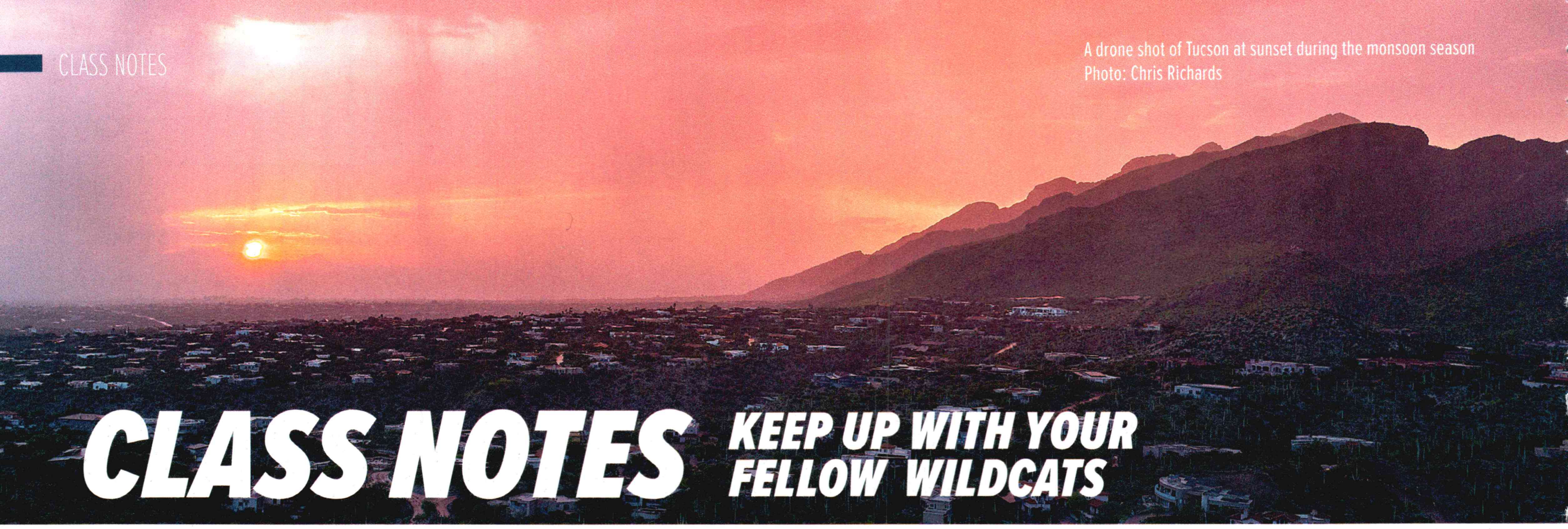
"People who look like me probably don't get as many marketing or sponsorship opportunities, but it's a blessing for me to help empower this change," Nnaji says. "Women's basketball is a sport full of diversity, and I think it's on all of us student-athletes to keep pushing things forward and empowering younger generations."

A McDonald's All-American in high school in Minnesota, Nnaji came to the University of Arizona because she could be a difference maker on and off the court. The Tucson community became an extension of home, and her foray into NIL was immediate after she set foot on campus.

"One thing I learned immediately at Arizona is about the power of marketing," she says. "You don't have to be the best player in the world to have value to an advertiser. You can have a growing brand and still be a very visible figure in ads or commercials."

Being a key contributor on a team ranked in the top 20 nationally in front of thousands and thousands of fans every game in McKale helped grow Nnaji's brand. Her first endorsement deal as a Wildcat was a reflection of the national audience she commands: Dunkin' Donuts.

"It was surreal when Dunkin' Donuts reached out to me," she says. "I couldn't believe this national brand wanted to work with me. The opportunities presented to me through this deal will set me up for future success, growth of my brand and more networking possibilities."



A drone shot of Tucson at sunset during the monsoon season
Photo: Chris Richards

CLASS NOTES

KEEP UP WITH YOUR FELLOW WILDCATS

1960s

Vandi Clark '67 is still acting. If you look closely at the trailer for "Asteroid City," Wes Anderson's latest film, you can find her.

Joan Elizabeth Danylak '69 released a book of poems, "Queen Elizabeth II Goes to Heaven," through North Star Publishing. She turned 80 in February 2023 and has been writing poetry since 1974. She was born in Brooklyn and raised with her brother, Rudy, in Queens.

Gary DeFazio '69 published his first book, "A Horse in a Tree," now available on Amazon and at book stores. Socks is a young horse whose vanity leads him into difficulty. But his animal friends in the forest — including Rupert the fox, Shelly the turtle and Woody the beaver — help him move forward, yielding a riveting story. Thanks to his companions, Socks discovers his inner worth.

1970s

Don Spong '70 received the Fusion Power Associates Distinguished Career Award in 2021 and the UT-Battelle ORNL Distinguished Researcher Award in 2020. A fellow of the American Physical Society's division of plasma physics, he models and simulates fast ion-driven plasma turbulence in fusion energy systems at Oak Ridge National Laboratory in Tennessee. Don also has twice served as a visiting professor at the National Institute for Fusion Science in Toki, Japan. In his spare time, he enjoys astrophotography.

Wendy Shattil '71, a professional wildlife and conservation photographer, received the Lifetime Achievement Award from the North American Nature Photography Association in Tucson this spring. Wendy was the first woman awarded the Grand Prize in Great Britain's prestigious Wildlife Photographer of the Year competition. She recently spurred the Friends of Camp Wildcat alumni team to create a University of Arizona scholarship for Southern Arizona students.

Barney Popkin '73 published two parts of a journal article, "The Role of Climate, Rocks, and Soils on the Wines of Napa Valley, California," in The Professional Geologist. He also published "Selected Aspects of Military Geology Applied to Ukraine" in the Global Journal of Human-Social Science, and he is writing another scholarly article, "Geologic Influences on the Natural Resources of the Levant."

Richard Lemin '76 was hired as co-managing director of Jewel Box Theatre — the oldest continuously operated community theater in Oklahoma — after retiring from a career in teaching. He has directed and acted in more than two dozen productions at Jewel Box since 1983, and his script for Charles Dickens' "A Christmas Carol" has been produced there twice.

Paul Scimonelli '77 published "Joe Cambria: International Super Scout of the Washington Senators" through McFarland Press. The book tells the life story of Cambria, an Italian immigrant to America who fell in love with all things baseball. Cambria's greatest accomplishment was his signing of dark-skinned Cuban ballplayers for the Washington Senators years before Jackie Robinson broke Major League Baseball's color barrier in 1947. Several of his signees went on to have Hall of Fame careers.

Silviana Wood '78 '83 published "La Quinta Soledad" through Aztlan Libre Press. The cross-genre novel, her second, tells a multigenerational Chicana family story, centering on the grandmother, mother and four sisters of narrator Quinta Soledad. Silviana has also published short stories and — in 2016 through the University of Arizona Press — "Barrio Dreams: Selected Plays." She is a Tucson native and a founding member of Mujeres Que Escriben, a professional Latina writers' group.

1980s

Deborah Folka '81 has published her first children's book, "In Zoey's Closet." Intended for 6-to-10-year-olds, it explores the encounters Zoey has with the magical creatures who emerge from her closet after lights-out. The book is available on Amazon and from zoeysbooks.com.

Gideon Adjei '82 is a biology professor and the author of six books. His most recent, "Hope: Dynamism of a Will and Way to Win," was published by Archway, a division of Simon & Schuster, and released in May. Through the book, a work of fiction, Gideon seeks to provide readers with guidance to navigate the journey of our times.

Robert Swick '83 retired from his position as president of Hughes Federal Credit Union, where he was first hired as a finance manager in 1986. Robert became the credit union's president and general manager in 1999. During his Hughes career, the institution — devoted to "people helping people" — grew from 31,000 to 178,000 members. Robert also obtained a low-income, underserved community charter for the credit union in 2001, permitting Hughes to serve more Tucsonans.

Wolfgang Golser '86 is a world traveler. On a recent trip to Ecuador, he visited Quito and all the major islands of the Galápagos as well as several of the minor islands. Wolfgang hiked, kayaked and snorkeled while checking out the volcanic archipelago's flora, fauna and geology. Among many highlights was his visit to the Darwin Research Station, located near Puerto Ayora on the island of Santa Cruz.

Carol Beidleman '88 and **Sue Sitko '92** reunited in Uganda in September 2022, 35 years after pursuing UArizona graduate degrees in renewable natural resources studies. Carol and Sue spent three weeks on a birding tour, visiting Mgahinga Gorilla National Park near the country's border with the Democratic Republic of the Congo. They are both retired following careers in natural resource conservation.

Mike Gillett '89 and **Susan Jensen Gillett '89** ran into fellow Wildcat **Leah Germain '12** in Playa del Carmen, Mexico.

Bob Logan '89 became a published author with the release of "Let Your Path Find You" by Sabino Press. The nonfiction self-improvement book encourages readers to overcome fears of failure, step outside their comfort zones and listen more closely to their inner voices. "Let Your Path Find You" also reflects on Bob's three through-hikes of the Camino de Santiago, a 500-mile pilgrimage across northern Spain. The book recently won a national award in the self-help category from the Nonfiction Authors Association. Bob, today a motivational speaker, was an assistant football coach at Arizona in the mid-'80s.

1990s

Rich Micelli '90 is president and CEO of the YMCA of Central Stark County in northeast Ohio. He began his career at the Tucson Y in college and has been with the YMCA organization for 35 years. Over his career, Rich has spent time in Arizona, California, Illinois, Texas and Ohio. He's been married to his wife, Debra, for 25 years, and their daughter, Grace, is a sophomore in high school.

Qin Sun Stubis '91 published a memoir, "Once Our Lives," through Guernica Editions. The book chronicles four generations of Chinese women, the impact of the Great Chinese Famine on Qin's once-prominent family, and her immigration to the United States, where she became a columnist at the Santa Monica Star. Qin also writes poems, essays, short stories and original Chinese tall tales.

Petri Darby '95, vice president of brand, creative and communications for the Charles Butt Foundation, was named president of the Austin regional council and secretary of the governing board for Make-A-Wish of Central and South Texas. He also serves on the Cedar Park Economic Development Sales Tax Corporation board of directors.

Anthony Madrid '96 published two books in April: a book of poems called "Whatever's Forbidden the Wise" (Canarium Books) and an edition of Martha Dickinson Bianchi's "Emily Dickinson Face to Face" (McNally Editions).

Christine Gacharná '97 published "RIGHT My College Application Essay" in April. She is the managing partner and creator of ESSAY CURE. Learn more at essaycure.com.

David Ardaya '98, president of Golden Optometric Group, was named the 2023 Optometrist of the Year by the California Optometric Association. The award recognizes his significant impact on Californians' visual welfare. David's advocacy work brought about the reinstatement of coverage for adult eyeglasses through the Medi-Cal program. Since 2005, he has practiced in Golden's Whittier office.

Tara Huffman '98 and 11 of her Kappa Alpha Theta sorority sisters — all from the class of '98 — came together on campus recently.

2000s

Jane Haladay '00, a professor of American Indian studies at the University of North Carolina, Pembroke, received the 2023 Board of Governors Award for Excellence in Teaching, given annually to one tenured faculty member at each of the 17 universities within the UNC system. The award recognizes exceptional undergraduate teaching over a sustained period. Jane has taught at Pembroke since 2006.

Mark Standridge '01 was appointed by New Mexico Gov. Michelle Lujan Grisham to serve as a judge on the Third Judicial District Court in Las Cruces. He has worked as an assistant United States attorney for the past year and was previously in private practice for a decade and a half.

Tyler Kent '06 conceived of and developed Tucson's Leo Kent Hotel, which opened in April in the tallest building in town, One South Church. The hotel's interior design takes after the history and soul of the city Tyler calls home, featuring art inspired by local flora and fauna: wildflowers, saguaros, javelinas, Gambel's quail. The St. Cruz Restaurant — a nod to the once-full Santa Cruz River — also is inside.

Sarah Liguori '06 was named to the Arizona Housing Fund advisory committee, which is responsible for reviewing grant applications from qualified nonprofits to bring more permanent low-income and working-poor housing to Arizona. The Arizona Housing Fund operates out of the Arizona Community Foundation in Phoenix, where Sarah serves as the senior director of impact investing.

2010s

Jessie Butler Allen '13 returned to the university as director of communications and marketing for the BIO5 Institute almost 10 years after earning a bachelor's degree in communications. Previously, she worked for the University of Tennessee, where she received a master's, and for the Tucson Airport Authority for nearly eight years.

Brian Gary '13 works in Huntingdon, United Kingdom, as an engineering supervisor for the U.S. Department of Defense, proudly displaying his Wildcat swag overseas. Although he and most of his coworkers are U.S. government employees, the team also includes a few U.K. citizens who get to hear firsthand that the university is the best in America. Brian met his wife of 12 years in school.

Kevin McAtamney '14 earned a master's degree in business management from Merrimack College and an MBA from Marist College. Outside of his studies, he accepted the role of regional vice president at Standard Insurance Company. Kevin also founded KRM Advisory Services while securing his real estate license. He lives in San Diego with his wife and their baby daughter.

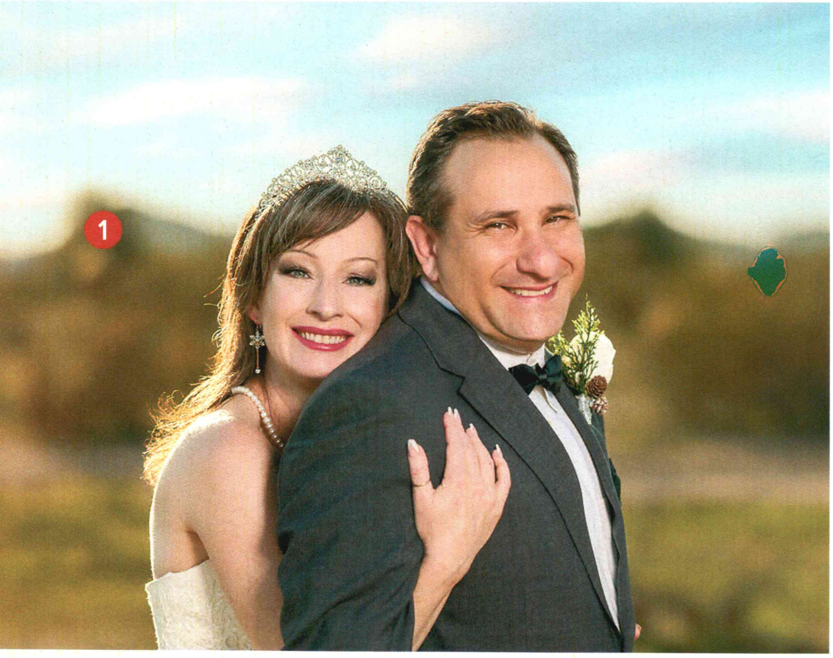
Daniel Victor '17, founder of HID SIPS, launched a one-of-a-kind product, the HydraLamp, as part of the company's mission to hydrate those in the desert and beyond. The HydraLamp fuses the modern style of an elegant table lamp with the functionality of a water storage and dispensing system so that users can stay hydrated in their bedrooms, at their desks or elsewhere. The HydraLamp has 10 dimming options and an interchangeable lampshade design to fit diverse lifestyles and decor.

Lucia Carminati '18 is an associate professor of history at the University of Oslo. Her first book, "Seeking Bread and Fortune in Port Said: Labor Migration and the Making of the Suez Canal, 1859-1906," came out in August through the University of California Press. She previously taught in the department of history at Texas Tech University.

Anusha Vishnubhotla '19 earned a master's degree in public health from Drexel University, specializing in epidemiology, and has accepted a job in Massachusetts at Moderna.

WEDDINGS AND FAMILIES

1. **Mark DiBone '02** and his wife, Crystal, were married in December 2022 in Carefree. **Chris Carpenter '02 '06**, **Halden Chairnoff '01** and **Kevin Radis '03** served as groomsmen.
2. **Joel McCorkel '05** married the love of his life Sept. 3, 2022. He spent the week before the ceremony in Montenegro with his best friends, most of whom are Wildcat graduates. The crew visited the Bay of Kotor, among other locales.
3. **Megan Fitzhugh '11** and **Andrew Lange '11** were married in October 2021 in Chandler. They met and began dating as sophomores in 2009. They live in Los Angeles but still cheer on the Wildcats from afar.
4. **Ashley Schaefer '14** and **Scott Angell '15** were wed at the Arizona Biltmore April 22, 2023.
5. **Anthony Del Castillo '18 '23** married his Wildcat sweetheart, **Sarah Jacquot '18 '22**, on the spring equinox — March 20, 2023.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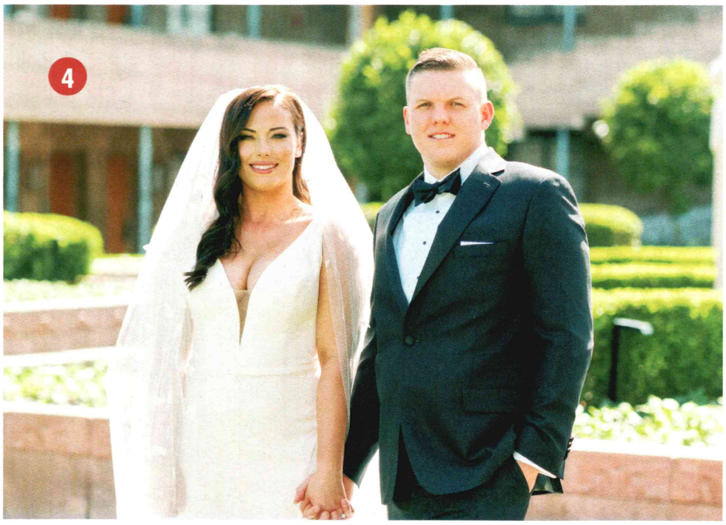
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IN MEMORIAM

Farewell, friends: We mourn the passing of these fellow Wildcats.

Harriett Leece ’48
Delbert Lewis ’50 ’01
Charles Ackerman ’51 ’53
Ruth R. Andres ’51
Donald Butler ’51
Frederick Sargent ’51
Carolyn H. Fedrick ’54
Keith Taylor ’54
Eloise R. Barter ’55
E. Ann S. Gammon ’55
George Grady ’56
Wayne Hancock ’56
J. Emery Barker ’57 ’60
Daniel Brennan ’57
Ellen Daacon-Kreyns ’57
Betty A. Hamilton ’57 ’74
Carolyn W. Kemmeries ’57 ’61
Lloyd Colbeck ’58
Barbara W. Friedrich ’58
Paul Aizley ’59
Robert Baksa ’59
Donna M. Nymeyer ’59
Elaine D. Taylor ’59
Dudley Welker ’59
Robert Chard ’60 ’62
Thomas Varnell ’60
William McEowen ’61 ’62
Antony Abraham ’62
Micheline McMillan ’62
Nancy B. Needham ’62
Rodney Wyse ’62
Frances A. Cucuzza ’63
Cathleen C. Stagg ’63
Kathi N. Skytta ’64
William Welch ’64
Ronald Barris ’65
Theodore Christy ’65
John Cooper ’65
Richard Merritt ’65
Carol L. Payne ’66
Elsa W. Baker ’67
Nancy S. Call ’67
Martha D. Cobb ’67 ’85
John Donaldson ’67
Stephan Gillespie ’67
Raymond Schroff ’67
Carolyn T. Bosworth ’68
Frank Crowe ’68
Joe Escalada ’68 ’70
James Madeheim ’68
Pamela T. Rogers ’68 ’70
Elizabeth F. Holland ’69 ’98
Thomas Lombardi ’69
Diane Ryckman ’69
Robert Swan ’69
Linda P. Yeoman ’69
Douglass Bartley ’70 ’73
Lang Lawrence ’70
Lawrence Wilson ’70
Watson Spoelstra ’71
Patricia L. Grames ’72
Rees Madsen ’72 ’74
Gary Delforge ’73
Stephen Bair ’74
Paul D’Alessio ’74
Astrid Neuhauser ’74
D. Glenn Baird ’75
Marcos Lucero ’75
Phyllis Naber ’75
Lawson Spicer ’75 ’83
Elizabeth B. Amstutz ’76
Sandra B. Buchman ’76
Emma C. Coltrin ’76
Robert Roosma ’76
Ronda H. Olsen ’77
Barbara C. Cooper ’78 ’81
Jeffrey Kottemann ’79 ’84
Kevin McIlvoy ’80
Kenneth Cole ’81
Hazel H. Jendritza ’81
Carol Vesterdal ’83
Deola Perry ’86
Patricia W. Ross ’86
Jeffrey Woods ’86
Mary T. Do ’87
Steven Dorazio ’87
Jeffrey Goldberg ’87
Katie C. Mimeles ’88
Cheryl M. Kulas ’89
Lisa Domini ’90
Diana Oedekoven ’90
Michele Ashpole ’91
David Krauth ’91
Mario Angotti ’92 ’93
James Schwiegerling ’95
Judith Shaw ’95 ’96
Donovan Durband ’97
Howard Bartol ’00
Jana Montana ’00
Jeffrey Markham ’02
Jill May ’06
Zachary Bopp ’12 ’17
Dereck Boles ’19
Scarlett Coleman ’20

This Laura Banks-Reed photo is from the 2018 Frances McClelland Vision Award recipient webpage.

CENTENARIAN LAURA BANKS-REED ’43 ’66 ’70 ’81

This Wildcat lived for 101 years. Laura Banks-Reed died April 14. She earned four degrees from the University of Arizona: bachelor of science, master of education, education specialist and doctor of education. For 39 years, she worked as an educator in Tucson, serving as a teacher, as a district reading coordinator, as the principal of Cavett Elementary School and as Tucson Unified School District’s first Black assistant superintendent. Banks-Reed later became president and owner of LNB Enterprises, an educational consulting firm.

A CENTURY OF EXPLORATION

100 YEARS OF SHARING THE NIGHT SKY AT STEWARD OBSERVATORY

BY ZOE MONTANO AND UNIVERSITY COMMUNICATIONS

For over a century, the University of Arizona's Steward Observatory has pushed the boundaries of astronomical research and established itself as a world leader in space sciences.

The observatory's story began with Andrew Ellicott Douglass, an astronomer who had previously served as UArizona president. Douglass established the observatory in 1918, having already established Lowell Observatory in Flagstaff.

Construction of Steward Observatory was made possible by a donation from Lavina Steward in memory of her late husband, Henry Steward. Its location was set off campus at a former ostrich farm, but today it can be found on campus at 933 N. Cherry Ave.

The observatory's dedication was delayed until 1923 due to World War I. When it finally opened, it included the first astronomical telescope built entirely out of domestic-made products, nicknamed "All-American." Despite its age, the original observatory telescope is still in use at Kitt Peak National Observatory southwest of Tucson, tracking asteroids and comets for the Spacewatch program.

To commemorate the observatory's 100th anniversary this year, patrons attended a lecture about the James Webb Space Telescope, learning about its infrared "eyes," which capture the latest findings on exoplanets. Guests also got a chance to view the Sonoran night sky through the observatory's state-of-the-art telescopes.

In addition, the event recognized Regents Professor of Astronomy Marcia Rieke, the first endowed chair in the department of astronomy at Steward Observatory. Rieke holds the Dr. Elizabeth Roemer Endowed Chair in recognition of her dedication and scholarship.

At the event, Steward Observatory Director Buell Jannuzi remarked, "For more than a century, the students, staff and faculty of Steward Observatory and the department of astronomy have explored the universe together and shared what we learned with the world, and we are excited to continue our efforts into our second century."

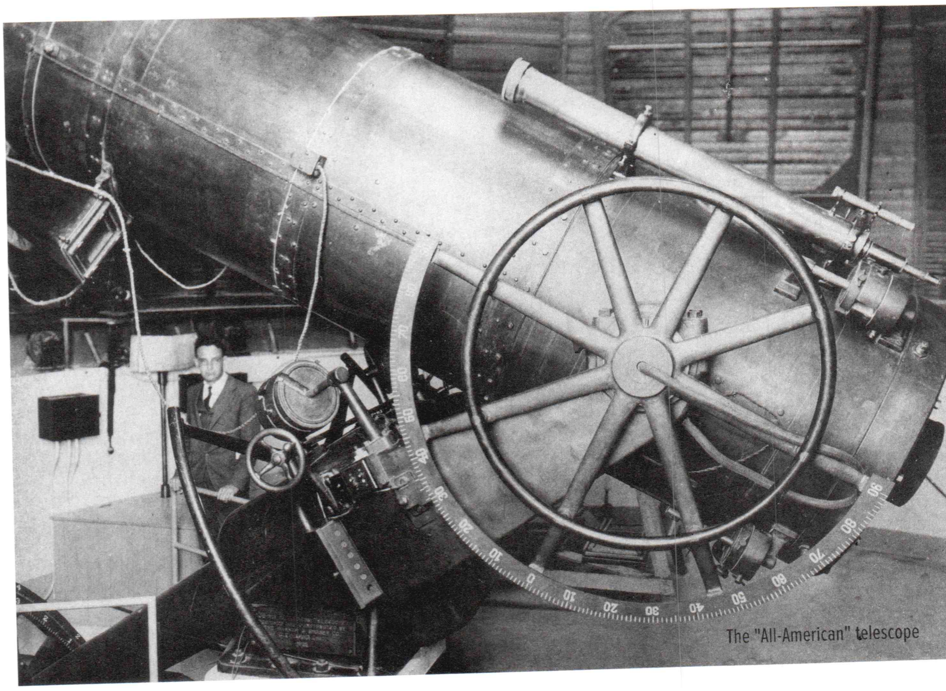
Over its first 100 years, Steward Observatory has helped build and operate over a dozen space telescopes across the state and at observatories in Chile and Antarctica. And Steward researchers have made history by developing crucial instruments for NASA's Hubble and Spitzer space telescopes.

UArizona also has become one of the founding partners in the Giant Magellan Telescope. When completed, it will be one of the world's largest. All its primary mirrors are being made at Steward Observatory's Richard F. Caris Mirror Lab.

The work has an economic impact as well as a scientific impact. "Together with the activities of our sister space science units — the Lunar and Planetary Laboratory and the department of planetary sciences — we have a huge economic impact on the state of Arizona, totaling $560 million annually," Jannuzi said.

Steward Observatory also contributes to the Tucson community through its public outreach facilities, such as the Mt. Lemmon SkyCenter science facility and Sky School, which provides science education opportunities to K-12 students.

Lavina Steward


The "All-American" telescope

Photos provided by Steward Observatory

In honor of Lavina Steward's gift over 100 years ago, we invite you to contribute as we shoot for the stars. Become a part of the story.

Denise TrimbleSmith, Ilyasah Shabazz and Bernice King
Photo: Veronica Rodriguez

BEYOND LEGACY

Daughters of Civil Rights legends speak in honor of Juneteenth.

By Matthew Morris

The civil rights icon Martin Luther King Jr. brought his nonviolent struggle for integration to Tucson twice, in 1959 and 1962. Both times, he spoke at the University of Arizona auditorium, today known as Centennial Hall. His first visit, notes the Arizona Daily Star, came exactly one year into his recovery from a stabbing at a book signing in Harlem, his second almost 100 years after the handing down of the Emancipation Proclamation — and a year before the birth of his second daughter and youngest child, Bernice.

Martin Luther King's life was cut short in 1968, during a visit to Memphis to march with Black sanitation workers. But 61 years after his second campus address — and on the university's inaugural observance of Juneteenth, no less — Bernice King graced the Centennial stage, spreading her father's good word beside Ilyasah Shabazz, daughter of Malcolm X, in a fireside chat marked by wisdom and humility.

During the talk, titled "Beyond Legacy: The Next Generation of Justice and Action," Bernice King spoke of the "righteous indignation" that she and Shabazz have carried since their fathers' assassinations, calling such anger productive in the push for societal change. A reverend who entered the ministry at the age of 17, King also spoke about following one's "assignment from the universe" — hers being, in part, to continue the efforts of her father and her mother, Coretta Scott King.

Shabazz, a writer and professor, contended meanwhile that "you can't have peace without freedom," calling the two "interchangeable," and seconded Bernice King's plea that history not drive a divide between their fathers, whose strategies in pursuit of racial justice often differed. Her presence beside King reinforced the sentiment.

As the women stood for photographs with moderator Denise TrimbleSmith, who when young imagined them as her best friends, the 2,000-plus attendees — Black, white and brown, old and young — rose with them.

COURTNEY WILLIAMS
Co-Founder,
Emagine Solutions Technology

MIKE HERNANDEZ
Site Operations Manager,
IBM Tucson

YAO SHI
University of Arizona graduate student,
Master of Real Estate

The UA Tech Park is one of the nation's premier research parks – at 30 years strong, it is a dynamic, interactive community where innovators and business leaders meet and where startup companies and technology giants work side by side. The Park's spacious campus encompasses 1,267 acres and has two million square feet of tech offices, R&D and lab facilities. It is home to 100+ companies that employee nearly 6,000 knowledge workers. As one of the largest employment hubs in the region, UA Tech Park has a $2.0 billion annual impact on the economy of Arizona and a projected $108 billion impact over the next three decades.

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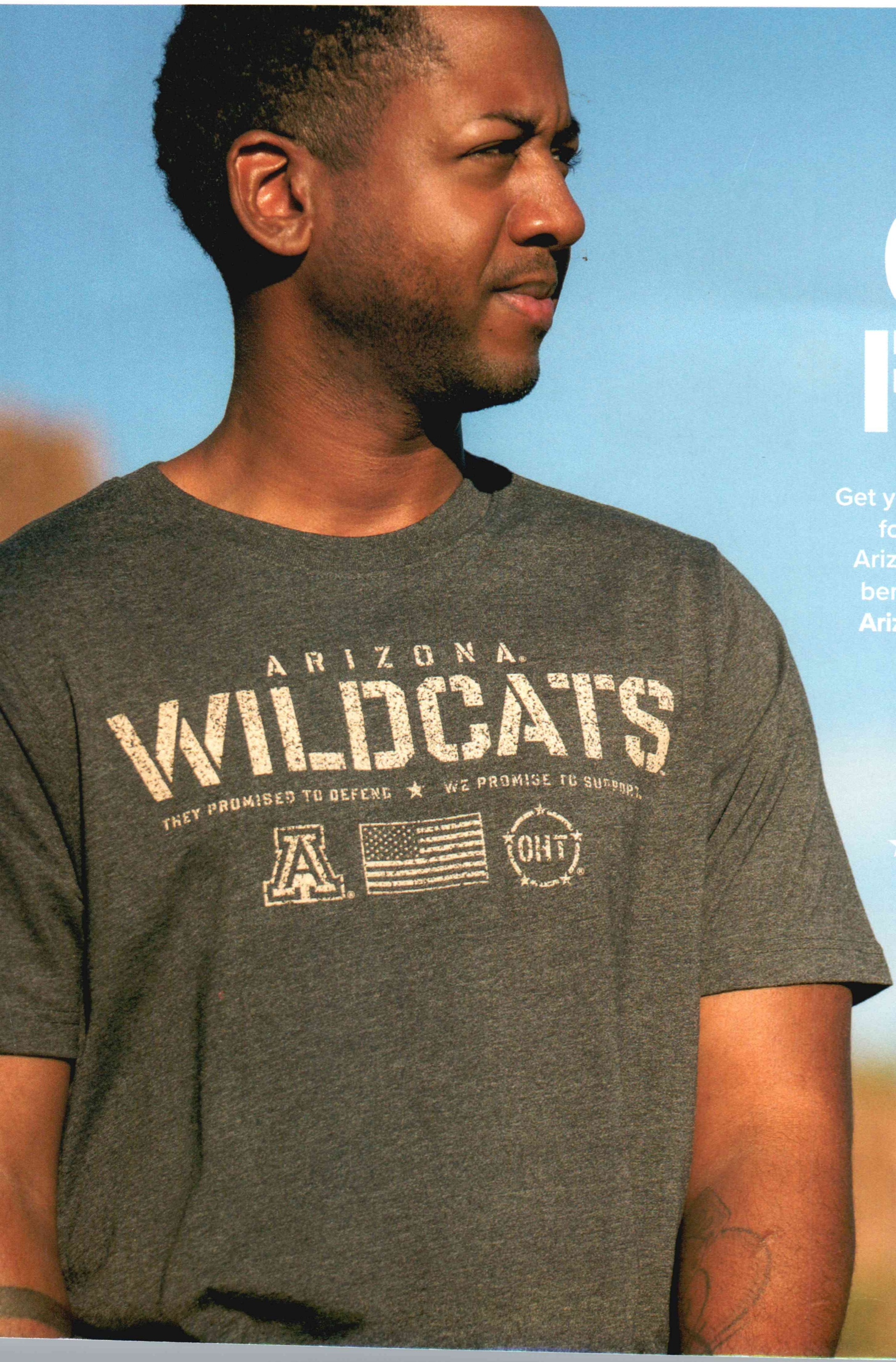
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